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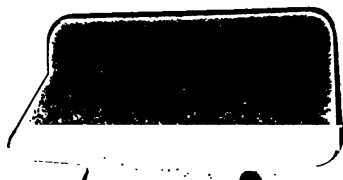
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THE
STUDENT'S GUIDE
TO THE
PRACTICE OF MEDICINE

THE
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TO THE
PRACTICE OF MEDICINE

BY
M. CHARTERIS, M.D.

PROFESSOR OF THERAPEUTICS AND MATERIA MEDICA, GLASGOW UNIVERSITY;
AND PHYSICIAN AND LECTURER IN CLINICAL MEDICINE,
GLASGOW ROYAL INFIRMARY

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PREFACE TO THIRD EDITION.

IN this Edition I have endeavoured to supplement the two previous Editions by additional details on important points, and to insert an account of some diseases formerly omitted. By using smaller type I have been enabled to do this without materially increasing the size of the book or altering the original plan. I trust it is still "handy" and practical.

I have to record my best thanks to Dr. Alexander Napier for valuable suggestions given to me, and for assisting me in seeing the work through the Press.

M. C.

GLASGOW, *May* 1881.



PREFACE TO FIRST EDITION.

THE idea of compiling this Handbook was suggested by my own experience ; and I have tried to write as one speaking to students. My aim having been to render it "handy" and practical, it is in many respects necessarily brief ; and as I desired to present ascertained facts, some points still in dispute have been only incidentally mentioned, not discussed.

I desire to record my special thanks to my friend and colleague Dr. A. M. Buchanan, and to my former assistant and highly-esteemed pupil Dr. T. O. Guthrie, for kind and willing assistance in preparing the sheets for the press.

My obligations to Dr Whittaker are seen in the illustrations.

M. C.

GLASGOW, *October* 1877.

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GENERAL CONSIDERATION OF DISEASE,
WITH
BEDSIDE HINTS.

WHAT is health? The answer to this inquiry can scarcely be given in the form of a definition, yet it requires no medical education to suggest a picture of what health is at the typical eras of human existence, when all the various functions of the human body are performed easily, naturally, and well. The healthy individual breathes without difficulty, the food taken is relished and properly assimilated, the blood is forced from its centre—the heart—onwards over the body, without valvular flaw or subsequent hindrance, and the brain, with its nervous expansion undisturbed by morbid fancies, controls the movements and the thoughts of the living organism. Disease is a deviation, to a greater or less extent, from what we thus realise, though we cannot define, as the standard of health. It may invade one or more of the systems we have alluded to, and it is the duty of the physician to find out, by the varied appliances of his art, what and where the disease is. Thus the student will perceive, what practical bedside experience teaches, that diseases are to be referred in many cases to certain systems—viz. respiratory, circulatory, digestive, integumentary, genito-urinary, and nervous. Each of these *systems being liable to various diseases, and the allocation*

to one of these systems having been made, it is the further province of the physician to ascertain, by a careful examination of the phenomena presented to him, what the particular disease which he is investigating may be. A little reflection or experience will, however, convince the student that all diseases cannot be brought under such a simple classification. There are certain diseases, by no means the least important, which, though presenting well-marked features during life, are found, by examination after death, not to have involved any one particular system. These must be called, for the want of a better term, General Diseases. The exact idea expressed by this will be better understood when these diseases are individually considered.

When we are called to investigate real or imaginary disease, the question presents itself to us, How is the nature of the disease to be determined? How is the inquiry to be prosecuted?

Pain is a prominent feature in disease, and important information may be obtained by asking—

“Where do you feel pain?” Follow this up by further inquiring—

“How long have you been ill?”

The patient in this way refers his pain to some particular part or parts, and tells the story of his illness in his own words, without any promptings on your side, which may be misleading. Now, with certain data to go upon, and with no preconceived, and therefore probably erroneous, ideas directing you, the systematic investigation can be justly commenced. If attention is directed to the chest, that region must be carefully explored by the three great means of Auscultation, Percussion, and Palpation. In order to facilitate inquiry, and to localise its evidences, the chest has been divided into certain regions, as the accompanying diagram will at once show; a fact which beginners should realise, not merely by looking at it, but by drawing the corresponding lines in *ink on a friend or fellow-student's chest*.

In Percussion the Pleximeter and Hammer may be used, or, in lieu of them, the first two fingers of the left hand may be applied flatly to the chest, and struck with the tips of corresponding ones of the right. Being already familiar with the sounds in health, you compare

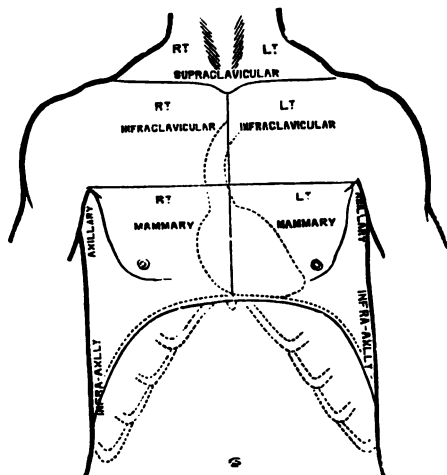


Fig. 1.

one region with the corresponding region on the opposite side, and note whether the sounds produced by percussion are healthy or the reverse, abnormally dull or abnormally clear.

Proceed in a similar way with Auscultation, by means of the Stethoscope, after carefully reading the chapter on Respiratory Sounds in Health.

Palpation, i.e. the application of the hand, shows the comparative movements of the two sides of the chest. It indicates also the vibration communicated to the chest wall by the voice, or what is called "Vocal Fremitus." *Mensuration*, by means of a graduated tape, reveals also

the comparative size of the two sides, and in some cases, by special instruments, tells the actual and comparative movement of the chest in respiration.

But supposing your patient does not refer his complaint to the chest, but to the stomach, then your inquiry must

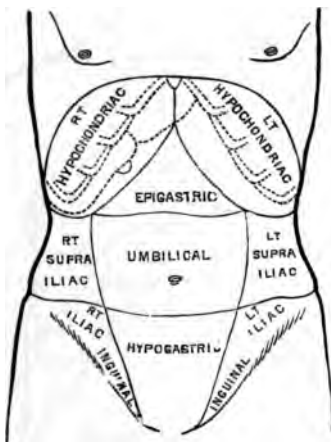


Fig. 2.

be directed primarily to the digestive system. Examine the tongue, ask as to his appetite and the state of the bowels. Percussion and Mensuration are now of great importance. The abdomen has also been divided by lines, as in the accompanying diagram.

If the patient refers his ailment to the kidneys or the bladder, your inquiry must be particularly directed to the urine, for this is the key-note to diagnosis. Note its colour, take its specific gravity, etc. (See chapter on Urinary Diseases.)

If he refers his complaint to the nervous system, try to discover from the symptoms presented what disease it

may be, remembering that the brain is an aggregation of various parts, and that the means which assisted you before are now of little avail,—“For the brain you can neither see, nor touch, nor handle.” The subject is thus beset with greater difficulty than in the case of the other systems mentioned.

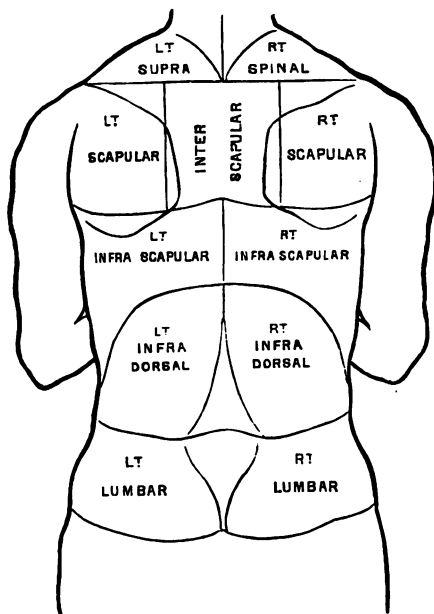


Fig. 3.

It is a matter of great importance, in the method of examination thus suggested, to remember that one system cannot be long involved without implicating, to a greater or less extent, some, if not all, of the others. While special attention is of course paid to the system containing the organ primarily diseased, it is essential

that the others should not be forgotten. It is immaterial in what order they are considered, but it is essential that no one of them be neglected ; and it is astonishing how, after a little experience, the student quickly and instinctively goes over them all.

Negatively, "General Diseases" may be remembered as not being brought under the systems mentioned ; positively, they are associated with a constitutional state and have a history of their own. Under the head of "General Diseases" are included what are termed Zymotic diseases, or diseases which it is supposed can be prevented by attention to hygienic or other conditions. Zymotic diseases are distinguished by the following characters :—"They are all of them febrile diseases. They all run naturally a definite course in definite though different periods of time. They all present during some (usually definite) portion of that course certain distinctive spots, making eruptions on the surface of the body. As a rule, broken and proved by rare exceptions, they occur once only in the same person. Lastly, they are communicable from person to person by contagion, and arise in no other way.

"Small-pox, chicken-pox, typhus fever, typhoid or enteric fever, scarlet fever, the plague, measles, whooping-cough, mumps, constitute Zymotic diseases." (Sir Thomas Watson.)

In investigating these diseases it will be found that they appear to be propagated by some unknown though probably atmospheric influences, owning no general law, spreading over a wide area (epidemic), or peculiar to certain fixed localities (endemic). Under "General Diseases" it will thus be seen are numbered the various fevers, some of which seem the offspring of filth and the neglect of sanitary laws ; while others depend on a specific something which is transmitted from person to person, probably through a disease-germ, and which through its specific character can originate *only the disease from which it sprang.*

Under "General Diseases" also are included various states of the body, in which the blood seems chiefly implicated, and which reveal themselves by local and constitutional and characteristic symptoms, as will be pointed out when individually considered.

The student, therefore, in forming an opinion with regard to diseases connected with the various systems, or with regard to general diseases, will see that an important element in this opinion or diagnosis must be the causation, the etiology, of the disease in question. Is it peculiar to one country or to many? Is it a disease of youth or age? Is it hereditary, or is it acquired? Is it dependent on known or unknown agencies? Is it characteristic of sex or occupation?

Having thought these things over, having gleaned what he can also from signs, symptoms, and history, his further duty is to form a prognosis, a forecast of the probable issue. Will it be fatal, or the reverse? What complications may arise, and how may these be averted? These and all previous considerations have one definite object in view, viz. Treatment, specially directed to the person who is ill, but also in certain cases prophylactic, *i.e.* guarding against the extension of the disease to others, if that be possible.

We now take up the first great class of diseases, viz. Fevers, of which Graves says—"In the whole range of human maladies there is no disease of such surpassing interest and importance as fever." The knowledge of fever in the abstract is essential for the proper treatment of all diseases, and hence it is, doubtless, that the literature of fever is so varied and voluminous.

The old physicians said—"Essentia vero febrium est præter naturam caliditas." And they were led to this definition by feeling the skin, which they recognised to be warm—warm above the natural temperature of the body—warm above what is consistent with health. In late years we have been enabled to estimate more accu-

rately than they did this increased warmth by means of the clinical thermometer, which may be placed in the rectum, vagina, mouth, or axilla. For obvious reasons the latter is the site generally chosen. If the bulb of the thermometer is placed in the axilla, and kept there from ten to fifteen minutes, it will be found in health to register 98.6° , or if it is placed in the rectum or vagina, it may rise to 99° , or even a little higher. Certain circumstances may occasion a variation from the points mentioned, and yet health may be retained. What circumstances are these? 1st, Long exposure to great heat or cold. 2d, Climate. The average temperature in tropical climates is greater than in temperate; e.g. it may reach 99.5° or even 100° Fahr. 3d, Food and drink. After a full meal the temperature first falls, then it increases as digestion goes on. Fasting lowers the temperature, and the taking of alcohol first causes a fall which does not last long, for it requires a considerable amount to have any material influence. 4th, Exercise also increases, while prolonged study causes a slight depression.

Aware of the existence of these circumstances, and bearing them in mind, the student may confidently assume that if these conditions do not exist, and yet the temperature remains persistently above normal, he has then undoubtedly to do with the state called Fever. It must be remembered, however, that increase of temperature is associated with many of the acute affections subsequently to be considered; and the student must not *ipso facto*, from mere thermometrical indications, and without carefully weighing probabilities, consider that he has to do with one or other of the continued fevers. In fever, as in all acute diseases, the temperature should be carefully taken morning and evening, and in hospital a chart, containing the daily result from the commencement, hung up in a convenient situation near the bed.

In accordance with what has been stated, Virchow's definition of fever is the best, as it is the shortest, viz.

“ That it is that state of the body in which there is an increase of temperature above the normal.”

In this country there are four kinds of continued fever—

1. Simple Fever or Febricula.
2. Typhus.
3. Typhoid.
4. Relapsing.

Simple Fever or Febricula is non-contagious, and depends frequently on errors of diet, exposure to the sun or cold, or other insanitary agencies which may fatigue or weaken the system.

Symptoms.—Following on one or more of these causes, without almost any warning, the patient becomes languid and disinclined for either mental or bodily work ; the appetite is lost, and headache ensues ; a dull aching pain is felt all over the body, especially at the back, accompanied with “ a creepy cold sensation ” difficult to define.

This creepy cold sensation is followed, in the course generally of a few hours, by increased heat of body (fever), rapid pulse, furred tongue, and scanty, high-coloured urine. Delirium through sleeplessness may supervene, and the state of matters may seem very alarming, when, after an interval of three or four days, there is a crisis. The pulse falls, the skin becomes moist, thirst abates, headache ceases, and a copious perspiration terminates the fever. The patient is left weak, yet convalescent, and the strength gradually returns.

Prognosis.—This fever is rarely dangerous. It may be added that its division into catarrhal, bilious, mesenteric, and brain fever seems unnecessary.

Treatment.—The indications for treatment, since the fever terminates in recovery, may be summed up in a few words. At the commencement give a saline purgative of sulphate of soda and sulphate of magnesia, or a Seidlitz powder. After the bowels have acted, employ a diaphoretic or diuretic mixture (F. 31, 40). The patient has

no inclination for solid food, and should not be urged to take anything but a sloppy diet, as arrowroot, milk-gruel, etc. Convalescence is to be assisted by nourishing food, such as beef-tea, chicken-soup, and wine. A tonic mixture is also serviceable (F. 75, 76, 77).

To understand properly what is to follow, it may not be out of place to give a short historical account of the two great continued fevers of this country—typhus and typhoid. Formerly the word “typhus” included a group of diseases, but as morbid anatomy became more studied, it was attempted to explain typhus by an anatomical definition. This was especially the case in France at the beginning of the present century; it being found that cases like typhus presented characteristic lesions in the ileum and mesenteric glands. It was therefore supposed that all cases of typhus would present these characteristic lesions, and much disappointment ensued when it was discovered that there were instances of typhus which a post-mortem examination failed to explain. So, gradually, French and English physicians were reluctantly compelled to admit that the cases seen must belong to different categories. And hence it became necessary to use the term typhoid (like typhus), and although objections may be urged against its employment since the diseases differ so materially in their symptoms, progress, and terminations, yet it is doubtful if a better one can be established without being open to grave theoretical objections. For its other synonym, “enteric,” conveys the impression that the inflammation of the intestine is the cause of the fever, whereas in point of fact it is the result. So also “pythogenic,” as applied by Dr. Murchison, implies that putrefactive changes, simply as putrefactive changes, can produce the fever—a conclusion which many deny.

Although the controversy which so long raged has now been practically settled, it seems impossible to doubt that these fevers presented distinctive characters from the earliest ages, although their anatomical differences and *clinical history* were only elucidated in recent years. For

it can scarcely be supposed that typhoid did not exist as well as typhus long ago. Its non-detection is probably due to the looseness and the carelessness displayed in recording the results of pathological observations. All intestinal ulcers were at one time classified under the term Dysentery, and very probably typhoid epidemics were simply treated and styled dysenteric epidemics. In the seventeenth century descriptions of cases, with accounts of post-mortem examinations, leave little doubt that typhoid fever was then widely spread in Europe. Such reports were given by Spigelius in Italy; by Willis and Sydenham in England; by Hoffman in Germany. In the eighteenth century its existence can be proved with certainty, for Morgagni describes a case with ulcers and perforations in the ileum and beginning of the colon, with swelling of the mesenteric glands and of the spleen. So also, other cases were reported with more or less minuteness, until, at the beginning of the present century, the French described epidemics of typhoid fever with constant intestinal lesions.

It was reserved for Bretonneau of Tours, in 1820, to prove that the disease was always localised in the solitary and agminated glands of the ileum. He also was the first to maintain that it depended on the action of a poison, which was communicated from the sick to the healthy; and, carried away by the discovery, he and subsequent French observers deemed it identical with the contagious typhus seen in camps and following armies. Then there came to be a wide division in the views of French and English pathologists—the former rarely failing to find the intestines diseased in continued fever, while the latter saw them healthy, and regarded the intestinal lesion as a mere accidental complication. So the controversy raged for some years, and it appeared puzzling to candid inquirers how eminent and truthful observers should record such seemingly discordant facts.

For it would appear clear, either that the intestine was diseased, or that it was not. It was, or it was not the

seat of ulceration. In 1835 Dr. Perry of Glasgow very nearly guessed the whole truth that the fevers were essentially distinct, though he admitted that the one might pass into the other. He was followed by Dr. Lombard of Geneva, and Messrs. Gerhard and Peacock of Philadelphia, who stated "that the distinctive characters of the two diseases were such as in practice could not allow them to be confounded." In 1841, Louis, in his great work on typhoid fever, admitted "that the typhus fever of the English is one very different from the one he is now describing, viz. typhoid." Notwithstanding this, the doctrine of non-identity did not remain unopposed, for different schools propounded different doctrines.

Much of the remaining doubt was, however, dispelled by the researches of Sir W. Jenner, published between 1849 and 1851. Not merely did he state the differences observed during life, but by an analysis of carefully recorded cases he showed the distinctive post-mortem features of typhoid. He also demonstrated that the two fevers were dependent on different causes, that the one did not communicate the other, and finally concluded by stating "that typhus and the so-called typhoid fever were as distinct as any of the exanthemata"—an opinion which all subsequent observations have tended to confirm.

After these remarks we now take up the separate consideration of the different fevers, commencing with

TYPHUS FEVER.

This fever was, as has been indicated, formerly called putrid, pestilential, ship, or hospital fever, and it derives its name from the Greek word *τυφος*, smoke. This fever is contagious, usually epidemic, and most frequently follows, or is the direct result of, destitution, overcrowding, and bad ventilation. It is eminently a disease of the poor.

Symptoms.—The fever poison having been absorbed *into the system*, there is a period of incubation of from one

to twelve days, during which time the patient feels out of sorts, with pains in his limbs, languor, loss of appetite, headache, thirst, and the "creepy sensation" formerly alluded to. These are succeeded after a varying interval by increased heat of skin, full and rapid pulse, restlessness, apathy, great thirst, and prostration. The patient no longer fights against his malady, but willingly keeps his bed.

Is there anything particularly characteristic of this fever?

There is what is termed the typhus rash, somewhat dark and mulberry-like in appearance. It consists chiefly of irregular spots, sometimes single and easily defined, at other times patchy from a number of them coalescing. They are most frequently seen on the chest and abdomen, rarely on back or face, and at first disappear on pressure. Their dark colour fades after a day or two into a brick-dust hue or mottling, which appearance increases until the rash becomes ecchymosed or hæmorrhagic, and in this later stage does not disappear on pressure, but remains permanent even after death, or until recovery ensues. The rash comes out once for all (not gradually), from the fifth to the eighth day of the fever, and is rarely absent in adults, although in young children it is not so frequently observed. In addition to this rash characteristic of typhus fever, there is also peculiar to it a dull, heavy, stupid expression of countenance. The eyelids droop, and the eyes have the appearance of those of a man recently recovered from a debauch.

With the fever there is generally delirium. This rarely comes on before the end of the first week, and usually continues until death or convalescence supervenes. The delirium is of a violent and painful character, and at first is not continuous. The patient can be roused to answer questions, take drinks, or show his tongue. Yet his expression is vacant, and he mutters when alone. Generally this stage is succeeded by a loss of cognisance of external objects, and by various delusions, especially

during the night. The patient tosses about from side to side, or he may shout madly, or endeavour to get out of bed. The mind is, in one word, thoroughly unhinged.

The pulse increases in rapidity, and at the same time gets more soft and feeble. The temperature rises in the first week to 104° or 105° , remaining about these points for a week, and then subsiding to the normal or sub-normal about the end of the second week.

The tongue becomes dry, brown, tremulous, and is protruded with difficulty, while the teeth and lips are covered with sordes, emaciation all the time going on, with tendency to contraction of the pupil, cold extremities, and congested conjunctivæ. In favourable cases the disease usually terminates on the fourteenth day from the commencement of the fever by a "crisis," which is ushered in by profuse sweating, a prolonged sleep, or diarrhœa; or more rarely there is no marked crisis, but rather a gradual subsidence of pulse and temperature ("a lysis.")

Should a fatal termination ensue, it usually happens between the twelfth and the twentieth day of the fever, death being preceded by great prostration, picking of the bedclothes, *subsultus tendinum*, involuntary passing of fæces and urine, and coma. The mortality is about one in five of those attacked, and the greater the age above ten years the greater the danger.

Complications.—Typhus may be complicated by the occurrence of acute bronchitis, pleurisy, or pneumonia, rarely by affections of the larynx or pharynx. The heart is sometimes softened, especially the left ventricle, and this gives rise to depressed action of the organ, and a loss of the first sound. At other times the sounds are well developed, and are accompanied by a vigorous and heaving impulse indicating over-excitement of the organ without softening. Other complications are gangrene of the extremities, bed-sores, very rarely diarrhœa—the bowels all through the disease rather being constipated.

Diagnosis.—The rash and the nature of the fever

distinguish typhus from any inflammatory condition of the lungs. Its further diagnosis from typhoid will be alluded to afterwards. Acute meningitis, for which it has been mistaken, is attended with nausea and vomiting, no rash, and delirium almost from the commencement.

Morbid Anatomy.—There is nothing characteristic in the post-mortem appearances of a fatal case of typhus fever. If there has been marked delirium we may expect to find the cerebral sinuses engorged; but in the majority of cases the brain is seldom altered. The spleen is softened, and in some cases enlarged. The heart may be somewhat atrophied, and the blood “dark and fluid.” Should there have been an inflammatory condition of the lungs, indications of this will of course be found on examining the thorax. The intestinal tract is healthy.

Treatment.—As in all epidemics of contagious diseases, the first cases are to be watched with special care, if possible placed in separate hospital wards, and the clothes and effects disinfected. In the early incubatory stage, Dr. Hughes Bennett recommended an emetic, which he said had saved him from one or two attacks, when he was certain the poison was in his system. If this stage be over, we must treat symptoms, remembering that we may guide, but can never cure a fever. A purgative of thirty to sixty grains of rhubarb may be given at the outset. Tepid water injections relieve after-constipation. The apartment should, if possible, be large and well ventilated, with a fire in the room. Intercourse with friends should be restricted, and attendance limited to skilled nurses. The head should be shaved, or the hair teased out, and cold lotions applied. The diet should consist chiefly of milk and weak broth, given in small quantities every two or three hours.

The following general indications with regard to the use of stimulants may thus be summarised:—Do not be in haste to begin them, and do not assume that *once begun it is necessary to continue them all through*

the fever. Few do well with stimulants at the beginning of the continued fevers ; as a rule they do harm until after the end of the first week, but much will depend on the type. Be guided in giving them by the type of the fever and the particulars of each case. Remember that signal loss of strength, rapid feeble pulse, and weakness of the first sound of the heart, are indications for their employment. If after the first dose the fever is increased, the temperature rising higher, and if the patient becomes restless, withhold the stimulant. But if he shows less languor, if the delirium is diminished, if the pulse becomes fuller, if the tongue is moister, if sleep comes on, and if the patient is easily roused from slumber, and sensible when roused, alcohol is beneficial ; and *vice versâ*.

The dose cannot be exactly regulated. You may begin with a tablespoonful of brandy or whisky diluted, and, if well borne, this may be continued, as circumstances require, every two or three hours, commencing in the morning. If wine is preferred, remember that sherry is most palatable, and that port is not better than other wine. A mixture of chloral and bromide of potassium is beneficial, especially at the approach of the crisis, if there is great irritability and sleeplessness (F. 69).

How are you to prevent bed-sores ?

Carefully look at points most exposed to pressure. On a suspicious blush appearing, rub up alum with white of egg and brandy, and apply it over the part, or wash the part morning and evening, and apply glycerine cream. If, through carelessness or ignorance, they have formed, the slough may be removed by a charcoal poultice, and then iodoform should be dusted over the sore or sores. Undue pressure should be avoided by pledgets of lint or cotton-wool secured by sticking plaster ; or, better still, put the patient on a water-bed.

The pulmonary complications are frequently relieved by hot poultices covered with oiled silk and the internal use of *ipecacuan* wine first, followed, if necessary, by

carbonate of ammonia. If the symptoms subside, these remedies must not be continued, as their tendency is to weaken the patient.

The excessive thirst may be obviated by cool drinks in abundance, water, lemonade, carbonic acid water, particularly that which has been made with distilled water.

Cold sponging is rather pleasant than useful, but high authorities recommend cold baths at about 87° Fahr., repeated day and night if the temperature rises above 103° Fahr. They are said to be generally well borne, and meet with no opposition from the patient, as soon as a few have been taken. In employing them it is not to be supposed that the patient is to be carried into a bath-room and then moved back to bed, but that a full-sized bath is placed near to his bed, into which he is carefully lifted. A sheet is placed hammock-ways in the bath and secured. Upon this he reposes while a large oiled silk covering prevents unnecessary exposure of the person.

TYPHOID FEVER.

Etiology.—The term typhoid literally means *like typhus*. It has also been termed “enteric,” “gastric,” or “pythogenic” fever. It is not, like typhus, markedly contagious, and it seems to be generated from, and is certainly disseminated by, bad drains, sewage gas, or fluids contaminated by sewage.

Symptoms.—The patient is attacked by the disease more insidiously than in typhus. There is no abrupt departure from health to disease. There may be a slight premonitory chill, followed by *malaise* and inability or aversion to work. The man feels out of sorts, and attends listlessly to his business; the child inclines to rest, and not to play with its toys. Then lying in bed is found to be a welcome relief, and there is no inclination to leave it. At the early stage of typhoid, as well as during the whole continuance of the fever, the ther-

mometer is found to be of great value. Thus, even although the pulse indicates little deviation from health, it will be found that the evening temperature is higher than the morning by about a degree—99·9° morning, 100·5° evening; and this characteristic of a high evening temperature compared with that of the morning is retained throughout the disease. The temperature rises gradually, and may reach 105° towards the end of the first week, after which it again slowly falls to reach the normal state, by a series of oscillations between the morning and the evening temperatures, which may continue for an indefinite time, extending even to weeks after other symptoms have gone. The general symptoms of fever are present—as thirst, loss of appetite, and headache. The tongue loses the colour of health, and becomes small and dry, having a pale brownish-yellow fur, with red tip and edges.

About the seventh or eight day of the fever small rose-coloured spots sometimes, but not invariably, appear on the abdomen, chest, or limbs, being situated on normal uncoloured skin. They may be few in number or numerous. Their form is circular, and they last three days, disappearing completely under pressure, to reappear when that is removed. Fresh crops succeed those previously formed, until the termination of the fever. They are rarely seen after the thirtieth day unless a relapse occurs.

The abdomen becomes somewhat enlarged, and on careful pressure over the right iliac fossa a gurgling sound is generally heard, with distinct wincing or even actual pain. Even when delirium is present, this wincing is usually seen by looking at the face.

Diarrhoea is usually present. In some cases the stools are numerous, in others only two or three in the day. The colour of the stools is characteristic, and best described as being like that of pea-soup. Occasionally they are tinged with blood. With diarrhoea there may be *marked distension* of the abdomen and tympanites.



J.T.W. 77

TYPHOID ULCERATION OF THE ILEUM.
 IN THE UPPER PART IS SEEN THE MORBID INTRUSION
 PUSHING THE RUGÆ ASIDE; AT THE LOWER PART
 THE DISINTEGRATION AND CHARACTERISTIC ULCERATION.

Course and Progress of the Disease.—The disease may end in recovery or death. If the former, after the twenty-first day the severity of the symptoms abates, and gradual convalescence ensues; the temperature falls, presenting a gradual approximation of that of the evening and that of the morning. If the latter, the patient may sink exhausted and worn out by the disease, or fatal hæmorrhage may ensue, or peritonitis from perforation through the ulcerated spots on the small intestine. As in typhus, acute inflammatory disease of the chest may complicate matters and be the more immediate cause of death. Again, death may occur from inflammation arising from absorption of foetid matter from ulcerated bowels.

Morbid Anatomy.—Characteristic traces of the disease are found after death, and are pathognomonic of typhoid fever. These are altered appearances of Peyer's patches and the adjacent mesenteric glands, and the lesions are most distinct in the group of glands nearest the ileo-cæcal valve. In the earlier stages the Peyer's patches are congested and swollen, and may be found projecting above the level of the mucous membrane like buttons. The surface of these raised patches may later on be eroded and ulcerated, and portions of them may slough away, exposing the muscular and even the peritoneal layers. The ulcer has sharply defined edges, and may vary in size and shape. Perforation of the thin floor of the ulcer is one cause of a fatal termination to the disease. The cicatrices left after these ulcers have healed commonly disappear after a few years. The mesenteric glands in the neighbourhood of the patches are enlarged.

Diagnosis.—Typhus and typhoid fever are both distinguished from febricula and relapsing fever by the longer continuance and course of the fever, along with the characteristic eruptions, and from one another by the following symptoms:—

1. In *typhus* the rash is mulberry-like, mottled, and

continuous, going on to ecchymosis, and hence resisting pressure. In typhoid the rash consists of rose-coloured spots, fading in three days, and giving place to a fresh crop. These spots disappear on pressure, and are not surrounded by mottled skin.

2. In typhus, the rash appears from the fifth to the eighth day; in typhoid between the seventh and the fourteenth.

3. In typhus there is no diarrhoea. In typhoid diarrhoea is common, and the stools are of a pea-soup colour.

4. In typhus the symptoms are generally cerebral; hence disquietude going on to coma, with an intermediate stage of delirium. In typhoid the symptoms are abdominal; hence diarrhoea, and pain on pressure over right iliac fossa. In typhus we see contracted pupils, muttering delirium preceded by disquietude and uneasy manner, and *congested conjunctivæ*. In typhoid we see dilated pupils, delirium preceded by apathy and somnolence, and no congestion of the conjunctivæ.

5. These fevers also differ in their duration, a crisis being reached in typhus on the fourteenth day of the fever; while in typhoid, not a crisis, but a lysis, is reached on the twenty-first day. Typhus may occur at any age, and is commonest amongst the poor. Typhoid is generally a disease of youth or adult life, is rare after forty, and shows no partiality for the poor.

Treatment.—The prophylactic treatment is of essential importance, for if the disease spreads from the dejecta of the fever patient, it is obvious that these should be carefully attended to, and not thrown without due precautions into privies or dunghills, whence they may contaminate the water or milk supply, and give rise to extensive epidemics. Accordingly, Liebermeister recommends the use of a porcelain bed-pan, strewed each time before being used with a layer of sulphate of iron; and, immediately after the stool has been passed, crude *muriatic acid* is poured over the fæcal mass. If practicable,

as in country districts, the contents of the bed-pan should now be emptied into trenches removed from water-supply sources ; and if in the town, where such a proceeding is impossible, thrown into the privy-vaults with a considerable quantity of the acid. Underclothing or bed-clothing soiled with the stools should be immersed in cold water to which a little chloride of zinc has been added, and then thoroughly boiled within twenty-four hours.

In investigating an epidemic of typhoid fever it is desirable to trace it to its source, and thus it will be essential in many cases, through neglect or ignorance of the prophylactic measures mentioned, to shut up suspected wells, stop the milk supply from an infected dairy, and in each hygienic regulation guard against a panic by giving to the people an intelligent reason for the institution of the measures adopted.

In individual cases a teaspoonful of ipecacuan wine may be given every ten minutes until vomiting ensues, if the patient is seen in the early stage, and before the spots have appeared. Purgatives should be avoided. After the disease has been established, it is necessary simply to watch and treat symptoms.

Should the diarrhœa be excessive or weakening, astringents may be given. As a rule, I never give them unless the stools are more than four in the day, and then I give (F. 17, or 22). There is not the same necessity for caution as in typhus with regard to the administration of opium, and the drug may be given either by the mouth or rectum ; if in the former way, combined with catechu (F. 17) ; in the latter, in the starch and laudanum injection. Should hæmorrhage occur, gallic acid is requisite, with brandy if there be great depression and exhaustion ; or the pil. plumb. c. opio, turpentine, or the subcutaneous injection of ergotine may be tried. Delirium and sleeplessness may necessitate sedatives, such as chloral, the bromide of potassium, or both combined (F. 69). Tincture of hyoscyamus is also serviceable. All physical restraint should be forbidden, as patients are generally

easily coaxed by a kind and skilful nurse to do what is requisite. Good ventilation, careful sanitary arrangements, cleanliness, and prevention of bed-sores, should be matters of routine.

"Attention to little things," as Sir William Jenner expresses it, is of paramount importance. Statistics prove that those patients who lay themselves up at its first approach, and do not attempt to fight against the disease, have by far the best chance of recovery. Thus, generally speaking, hospital experience testifies that of patients admitted at the end of the 4th day, 5 per cent die; between the 4th and 11th, 13 per cent; after the 11th, 28 per cent. Physical exertion, weariness, prolonged railway travelling, all movements, either on foot or horseback, or jolting in a carriage during the early and insidious progress of the fever, are to be carefully avoided.

The patient should be confined to bed on the first suspicious symptom, and should not be allowed to leave it until the evening temperature is normal for from three to six days.

Personally, I have found milk the best dietary for a typhoid fever patient, given at regular intervals of every hour or two hours, so that in all five or six pints are consumed in the course of the day. A little iced water may be given between times. Some supplement this by mucilaginous barley water, then oatmeal gruel, and not very strong meat-soup. The general remarks made about stimulants under typhus apply equally to typhoid (see pages 15 and 16).

The nurse should see to the bed-pan being employed, and on no account should the patient be allowed to go to stool, however slight the fever. All unnecessary exposure when the temperature is taken should be avoided; all business affairs, all annoyances, kept away from the sick-bed. Questions should be briefly and kindly answered, but conversation studiously interdicted. The temperature of the room should be kept about 64° Fahr.,

not higher. Care should be taken of draughts, and in private houses, if practicable, a window should always be kept open in the next room, and the door between the two rooms never closed.

On the return of convalescence the patient should be warned against rising too soon, or changing the milk diet, or supplementing it by other food. It must be remembered that the ulcers are now cicatrising, and any error in diet may prevent this, and bring on alarming symptoms. Besides, relapses are not uncommon. An addition may gradually be made to the milk by a little weak soup or broth. Then give arrowroot with dry toast, and finally, beef-tea; although the latter should be avoided if there is any tendency to diarrhoea. No solid food should be ordered until the tongue is clean, all pain on pressure over the iliac region gone, and the temperature normal.

Latterly, under the impression that the true danger in this, as in other fevers, consists "in the deleterious influence of a high temperature" on the tissues, it has been attempted to lower the abnormal temperature. This treatment has been termed "antipyretic," and may be carried out as follows, if the temperature should be over 102.2° in the axilla:—1st, A full-length cold bath of 68° Fahr. of ten minutes' duration, and repeated so that in severe cases twelve baths are given every twenty-four hours; or 2d, Give from twenty-two to forty-five grains of quinine within the space of half an hour or an hour, and do not repeat it, as a rule, until two days have elapsed. 3d, In exceptional cases, digitalis may be combined with the quinine, so that eleven grains of the powder of digitalis may be, cautiously given at intervals during thirty-six hours, and followed by the large dose of quinine previously mentioned. This line of treatment in typhoid fever, according to the statistics of Liebermeister, seems to have been highly successful; but it is to be remembered that in English practice it has not yet been *sufficiently tried to be absolutely recommended.*

Finally, it must be remembered that a careful thermometric chart of the temperature, as taken morning and evening, is the only satisfactory index of the fever.

RELAPSING FEVER,

known also as recurrent typhus or famine fever, was long confounded with typhus, as epidemics of relapsing fever have usually co-existed with epidemics of typhus. Accurate historical records clearly show how careful observers saw its non-identity with ordinary typhus as far back as 1817, and how this opinion was confirmed by the remarkable epidemic of 1842-43, which was chiefly confined to Scotland. These opinions gained greater strength when it reappeared in 1846, and lingered with varying intensity in different parts of the United Kingdom until 1853, when it entirely disappeared from this country for fourteen years. In 1868 it again was observed in London, and also attacked other large towns. Since 1871 no cases of relapsing fever seem to have been noted. The observations made as to the nature of this fever clearly prove that it is highly contagious; that it may originate from filth, overcrowding, and destitution—notably the latter; that it is allied to times of scarcity, and thus has its home chiefly in the dwellings of the very poor. Lebert and other German observers found a strange peculiarity in the blood of relapsing fever patients, viz. thin, thread-like, spiral organisms of a vegetable nature, called the spirochæte. They occur in the blood during the onset of the attack, and are supposed to enter the system either directly or through the taking of fluids or solids. The period of incubation is from five to seven days. It is most common in early childhood, and from the 20th to the 30th year. Between 30 and 50 it is rare; and after 50 it is scarcely ever seen.

Symptoms.—Unlike the other fevers mentioned, there are no forewarners. The disease sets in suddenly with *headache and intense fever*, which at once prostrate the

patient, and it is accompanied with thirst, loss of appetite, pain in limbs, and burning heat of skin. The temperature for the first two days is usually 102° morning and 104° evening, and then it mounts to 105° and 107° . The pulse is weak and quick, and the skin moist. The tongue is thick and coated, not parched and black, as in typhus. The bowels are constipated.

On the second day the liver and spleen, especially the latter, notably enlarge—not merely from day to day, but from morning to evening. There is little delirium. The high fever, the rapid loss of strength, the splenic enlargement, indicate a fever likely soon to be fatal; when, as suddenly as it came, on the fifth, sixth, or more usually on the seventh day, there is a crisis, with profuse sweating, rapid fall of temperature, and complete improvement of all the symptoms, with entire decrease of the splenic enlargement. The only thing left is great languor, which sometimes may approach syncope.

This interval of freedom lasts usually a week, when a relapse occurs, generally at night, with all the symptoms which characterised the previous attack. This attack is, however, shorter, lasting only three or five days. It suddenly ceases, leaving the patient weak and anæmic, and entailing a lingering recovery of from four or five to six weeks. As many as four or five relapses have been known.

Prognosis and Complications.—In only two or three per cent of the cases is the fever fatal. Death may occur from the intensity of the fever, or from complications, as pneumonia or abscess of the spleen.

Post-Mortem Appearances.—If death occur from the disease, the spleen may be found greatly enlarged, the capsule tense, the parenchyma soft and pulpy, with wedge-shaped impactions due to emboli. The liver and kidneys are also congested. Nothing of special note is observed in the other organs.

Treatment.—Rest in bed, cleanliness, milk, strong soup, and wine, are necessary. A bladder of ice may be applied

to the head, to relieve headache ; and water charged with carbonic acid given to allay thirst. For splenic pain apply cold applications or continuous poultices.

Ten drops of dilute phosphoric acid should be given in sweetened water every two hours ; if symptoms of collapse, carbonate of ammonia and alcohol ; if delirium, 15-grain doses of chloral every hour, until one or two drachms have been taken.

During convalescence, good nourishing diet, with wine, and the preparations of quinine and iron, are essential.

INTERMITTENT FEVER, OR AGUE.

These fevers constitute a class by themselves, and were well known to the ancients.

They are dependent on certain marshy miasms, and are endemic, not epidemic, in character.

The febrile phenomena occur in paroxysms, ushered in by rigors, and terminate by a critical sweat.

There are three distinct stages—1, a stage of chill ; 2, of heat ; 3, of sweat.

The fevers are divided into types according to the length of these stages, for the attacks occur pretty regularly—every twenty-four hours (quotidian) ; every forty-eight hours (tertian) ; every seventy-two hours (quartan).

The time between the commencement of one paroxysm and the beginning of the next is termed the interval ; that between the termination of one paroxysm and the commencement of the next the intermission.

The type most common in temperate climates is the tertian.

Etiology.—While the predisposing causes are those which weaken the system, as exhaustion, insufficient food, intemperance, or exposure to night air, the exciting causes are certain peculiar invisible emanations, undetected by chemistry or the microscope, which are known as malaria, and spring chiefly from marshy lands. Most probably decomposing animal and vegetable matters, chiefly,

if not entirely, the latter, furnish the *materies morbi*, for it is an established fact that ague in time past was common in certain tracts of country then uncultivated, whereas now, since the land has been purified by agriculture, the disease is unknown.

Symptoms.—The invasion may take place suddenly or after a few days of indisposition, with headache, loss of appetite, and sneezing.

The *cold* stage is characterised by chilliness first in the limbs, and afterwards over the whole body, with a sensation of streams of cold water running down the back; shrivelled skin, "*cutis anserina*," chattering of the teeth, blueness of the nails, hurried respiration, and small pulse.

The duration of this stage varies from half an hour to three or four days, and is succeeded by the "*hot stage*" or reaction, with increased temperature, dry skin, great thirst, frequent pulse, and a peculiar fulness about the head.

This hot stage usually lasts from three to four hours, but it may be prolonged to six, eight, or twelve hours, and is then followed by the "*sweating stage*," beginning with a diminution of the heat, followed by a gentle moisture on the forehead and breast, and terminating in a copious, sour-smelling, steaming sweat, with an abundant flow of urine, normal pulse, and a cessation of all pain or uneasiness. The urine during the three stages mentioned varies; thus in the cold stage it is usually increased in quantity, clear and watery, of low specific gravity, and without sediment. In the hot stage it is voided but sparingly; it is also red and of high specific gravity. In the sweating stage it is passed freely; it is of high specific gravity, rich in solid ingredients, and throws down a brick-dust sediment of the urates.

This stage in its duration cannot be easily determined, but it appears materially to exceed the other two.

The fever thus described rarely results directly in death, but it often induces permanent enlargement of the spleen, with induration, popularly known as the *Ague Cake*. The enlargement is a pure hypertrophy—that is,

an enlargement of every element of the organ—and is accompanied by a peculiar cachexia.

There is also congestion and perfect morbid change in the liver, with serious disturbance of all the digestive organs. The patient is subject to cachexia from enlargement of the spleen, and even after his recovery from that he is much more subject to recurrences of the fever, which do not necessarily require new exposure; and the periodic character may imprint itself upon other diseases, as epilepsy or neuralgia. He seems to carry the seeds about with him.

Treatment.—In the cold stage the patient should be placed in bed covered with blankets and rugs, with hot bottles applied to his feet, and hot drinks, such as tea or weak negus, should be given.

In the hot stage cooling drinks are required, and the body should be sponged with tepid or cold water.

In the sweating stage great care must be taken to prevent chills, and the action of the skin should be encouraged by tepid drinks.

Quinine being the great remedy in this fever, it may be asked, When should it be given? at what period of the fever? and in what doses? and how long should it be continued? The answer to these inquiries may thus be summarised: It should be given during the intervals, in a large dose, 20 to 30 grains, and at the close of the paroxysm, and repeated in 15-grain doses, with an interval first of one, then of two, three, and four days. Further paroxysms being thus averted, it should be taken for some months in ordinary therapeutic doses. The reason why quinine is not given immediately preceding the paroxysm is, because the stomach is apt to reject it, and it only aggravates what it fails to avert. Probably the hypodermic injection might hasten its activity, and cut short the paroxysm, even though begun. The sulphate of quinine can be dissolved in tartaric acid in the proportion of 30 grains of quinine, 15 of tartaric acid, and half an ounce of water. So prepared it causes no pain on injec-

tion, and gives rise to no abscesses or other inconvenience. Each injection of 20 drops contains three grains of quinine. Ten minutes after injecting the quinine can be detected in the urine, by the tests of the iodide of potassium or the iodide of potassium and corrosive sublimate (F. 94).

REMITTENT FEVER

appears to be dependent on the same causes as intermittent fever, viz. malaria. It is also endemic, non-contagious, and is chiefly confined to tropical climates. The different localities in which it prevails have led to its being designated by various names. It is thus called Walcheren fever, Bengal fever, bilious remittent of the West Indies, jungle or hill fever of the East Indies, African fever, Mediterranean fever, etc.

The symptoms resemble those of intermittent fever; it is distinguished from it, however, by the notable fact that in the intervals there is no entire cessation of the fever, but simply an abatement or diminution. The disease continues from twelve to fourteen days, and the period of remission varies from six to twelve or fourteen hours. It is worthy of note that a distinct sliding scale of periodicity can be traced from intermittent fever down through remittent to the severe tropical continued fevers.

Symptoms.—The fever is ushered in with gastric symptoms, uneasiness, depression, and sinking at the epigastrium, with headache and languor. The cold stage is scarcely marked, or, if so, is rapidly succeeded by a severe hot stage, with burning skin, vomiting, sleeplessness, intense headache, or even delirium. This stage, usually lasting the time mentioned, is succeeded by an indistinct stage of sweating or subsidence, and is followed by another attack similar to the first, but more severe. These attacks and varying remissions constitute the fever, which *terminates in recovery or death, often in permanent ill*

health. Occasionally there is jaundice, and the liver and spleen are enlarged and tender. The remissions usually set in during the morning, while the exacerbations take place towards the evening.

Treatment.—The object of treatment is to mitigate the exacerbations, and lengthen the remissions, and is based on the same principles as those indicated in intermittent fever. Thus, see that the bowels are acted on, sponge the body, or use the cold pack, and give effervescing and saline drinks. When the remission occurs, give quinine in doses varying from four to six grains every three hours, omitting the remedy when the hot stage commences, but resuming it at the next remission. Cold should be applied to the head if the headache is severe, and sinapisms to the stomach to relieve the gastric irritation. If there be much exhaustion, stimulants should be freely given.

At the termination of the disease the patient should, if possible, be sent to a temperate climate, or a non-malarious district.

In very chronic cases fresh air and outdoor exercise seem to be beneficial, with the administration of iron. Dr. McLean highly recommends the use of the biniodide of mercury ointment over the spleen, which has the advantage of never causing salivation.

YELLOW FEVER

requires an average temperature of at least 72° Fahr. for some weeks to produce its appearance, and seems peculiarly to affect the West Indies, Africa, and some parts of America.

It varies in severity, frequently terminating in death either by the acuteness of the fever, or by exhaustion or intercurrent complications, such as uræmia or apoplexy. It is sometimes epidemic, and it is a matter of dispute whether or not it is contagious. It appears to be dependent on some morbid poison, probably of malarial origin.

Symptoms.—The fever commences abruptly, often in the middle of the night, and is attended with severe headache, great irritability of the stomach, with vomiting, and a peculiar yellowness of the skin; the vomited matters at first being slimy and tasteless, and afterwards black, like coffee grounds—hence called black vomit. The urine is frequently suppressed; if passed, it is loaded with albumen and tube-casts, and is smoky in appearance. The fever usually lasts from three to five or seven days.

When six days elapse without the occurrence of black vomit or suppression of urine, hopes of recovery may be entertained. The mortality is usually one in three.

The symptoms of the fever point to the poison specially affecting the liver, which is supposed to undergo acute fatty degeneration. The poison is considered to produce certain specific changes in the blood—viz. destruction of the red corpuscles. The blood thus loses its capacity for nourishing and regenerating the tissues, and when death does not take place there is a lingering convalescence, consequent on the feebleness of the whole organism.

Treatment.—Although yellow fever is dependent on malaria like the preceding fever, it is to be remembered that the spleen does not seem to be affected, and hence, probably, quinine is of little service. We have no specific for the disease, and the treatment is thus symptomatic. At the outset castor oil and calomel are given to overcome the constipation which generally exists. For the relief of the nausea and vomiting ice may be swallowed, and morphia subcutaneously injected in the epigastric region.

Hæmisch suggests that transfusion after previous blood-letting might paralyse or modify the injurious operation of the yellow fever miasm.

As soon as the stomach is able to retain food and drink, a light nutritious diet is essential, with wine and quinine and preparations of iron.

DENGUE OR DENGÉ

is a peculiar exanthematous disease which has prevailed epidemically in Eastern Africa, British India, the West Indian Islands, and the Southern States of America. The epidemics invariably appear after long intervals, and they seem to originate independently of any antecedent case. After an interval of about fifty years, the last epidemic of Dengé originated in Zanzibar in 1870, and continued to spread in India till 1875.

Symptoms.—After a short, but indefinite, stage of incubation, the patient is suddenly attacked with pain and stiffness of the muscles, specially in the palms of the hands and soles of the feet, rendering every movement very painful. This is speedily followed by pain over the whole body, more particularly in the back, shoulders, and ankle-joints. After twenty-four hours there is swelling of the small articulations and severe pain on pressure. The febrile stage sets in immediately after the accession of pain, and is accompanied by a scarlet efflorescence extending between the cheek-bones, across the bridge of the nose. The average duration of the febrile stage is about forty-eight hours, and this is followed by a period of remission of from two to three days. On the fourth day, the febrile symptoms reappear; and, on the fifth day, the peculiar exanthematous eruption comes out, spreads over the entire body within forty-eight hours, extending from the head and face to the lower extremities. When the eruption has become general, the lymphatic glands begin to swell, the occipital invariably; the mucous membrane of the mouth and nose is implicated, and sometimes the throat. On the fifth and sixth days, the symptoms reach their maximum of intensity; and on the seventh or eighth day, desquamation of the cuticle begins, and terminates as in scarlatina. Dengé is very rarely fatal.

Treatment.—It is almost always necessary to administer an active cathartic, as obstinate constipation is the rule. Quinine, in five-grain doses, should be given, after the bowels have acted freely. When the febrile symptoms disappear, iodide of potassium, in four or five grain doses, should be given and continued during the period of remission and for several days after desquamation has been completed.

THE PLAGUE,

called by Heberden "The black death," was formerly prevalent throughout Europe, and terribly fatal. Now it is little known except in certain parts of the East, Egypt, and Asia Minor. It is caused by a morbid poison, which spreads by contagion, and *is epidemic in its nature.*

Post-mortem appearances reveal great congestion of internal organs, especially the spleen, with effusion into serous cavities.

It is characterised during life by fever of a low type, with high delirium tending to a typhoid form, by enlargement of lymphatic glands and formation of buboes, with carbuncles and ecchymoses, vomiting of black matter, and hæmorrhage from the mouth, stomach, and bowels. There is often, also, a cutaneous rash like that of typhus.

It terminates most frequently in death.

ERUPTIVE FEVERS.

Small-pox, measles, and scarlet fever, are simply continued fevers, with a characteristic eruption superadded. In these fevers a definite period of time elapses from the reception of the fever until the appearance of the eruption and its final disappearance. Thus, measles has an incubation of from twelve to fourteen days, the eruption appearing on the third or fourth day of the fever, and fading on the seventh.

Scarlet fever has an incubation of from four to six days, the eruption appearing earlier than in measles, viz. on the second day of the fever, and disappearing on the fifth. Small-pox has an incubation of from twelve to fourteen days, the eruption appearing on the third day of the fever. The eruption does not fade away so rapidly as in the other two; scabs form on the tenth day of the fever, and commence to fall off about the fourteenth.

These fevers are distinguished from one another not merely by the facts mentioned, but by other peculiarities.

SMALL-POX.

The first authentic narrative of small-pox as a distinct disease is given by an Arabian physician, Rhazes, in the year 900, and it was recognised in after years as the most dreaded scourge of the human race, as the hereditary curse of mankind, as an inheritance which neither time nor medicine could dissipate. To rob it of some of its terrors, to modify its most alarming features, Lady Mary Wortley Montague, in 1718, introduced the practice of inoculation. The essential character of this proceeding was the insertion of small-pox matter in a healthy person.

and it was found that small-pox so imparted gave rise to a milder form of the disease, and less chance of succumbing to the virulence of the poison than when caught in the ordinary way. The benefits conferred by its adoption were great to the inoculated ; but small-pox perpetuates small-pox, and in proportion as inoculation was actively undertaken, centres of contagion were multiplied, and almost every home was converted into a hospital. Inoculation did not diminish, nay, it actually increased, the mortality from small-pox.

The vitality of the disease was thus not conquered when Edward Jenner, on 14th May 1796, announced the birthday of vaccination. On that day matter was taken from the hand of Sarah Nelmes, who had been infected by her master's cows, and it was inserted into the arm of James Phipps. Satisfactory vaccine vesicles ensued. Subsequent experimenting by small-pox inoculation on the same boy yielded a negative result, and Jenner believed that vaccination, actively and efficiently performed, would in the course of time obliterate small-pox, and cause it only to be remembered like extinct epidemics of the Middle Ages. This estimate—naturally a sanguine one of Jenner's—has not been confirmed, for small-pox still exists, it may be, owing to gross carelessness or wilful neglect, or inefficient performance of vaccination ; and when it occurs on an unvaccinated person, it has lost none of those features which rendered it so repulsive and fatal in bygone times. It is still the loathsome malady dreaded by all who have seen it, and even avoided by those who know it only by repute. Occurring, however, on a person who has been previously vaccinated, it is a mild, non-fatal disease, and loses also its hideous characteristics. Briefly stated, it may be said then to present an eruption limited to a few scattered uncoalescing pustules, which reach their acme on the fourth day, and then crisp and die away. There is no delirium and no pitting in the vast majority of cases, and the mortality is only 1 per cent. Except in the premonitory fever, which is of the same intensity in both, the two diseases are essentially distinct.

After these remarks, it may now be observed that in small-pox a specific poison is taken into the system, and after twelve days' incubation fever is ushered in with shivering, weariness, and pain in the small of the back, and very frequently vomiting. These two latter symptoms are very characteristic of small-pox, and may guide in distinguishing it, before the eruption appears, from the *two other fevers* mentioned. Sometimes very acute *delirium* may appear in the first twenty-four hours, not

remaining over three days. In children convulsions are substituted for the delirium. Lachrymation and salivation are often early symptoms. A papular eruption appears on the third day on the forehead, neck, and hands, then on the trunk, and lastly on the lower extremities. If the papules remain separate and distinct, we have what is termed Simple Small-pox, or *Variola Discreta*. If they are numerous, they coalesce, and we have Confluent Small-pox, or *Variola Confluens*.

In *Variola Discreta* we observe on the third day a vesicle forming on the papule, and around this an inflamed area. Two days after this the transparent lymph, which the vesicle at first contains, is changed into pus. After this the top becomes gradually depressed until it divides the pustule into two. This condition is termed *umbilication* and is very characteristic of the small-pox eruption. A peculiar greasy odour, difficult to describe, but never forgotten if once perceived, is now apparent in the room.

About the ninth or tenth day the pustule breaks and a scab forms. These scabs fall off about the fourteenth day of the fever, and a red stain is left on the skin, which gradually disappears. Should, however, the true skin be attacked, a permanent mark remains, and the patient becomes pock-marked.

In *Variola Confluens* the simple state of matters we have described is generally altered for the worse. The headache, the pain in the back, and the vomiting, are more severe, and a more copious eruption appears. Developing as the simple type did, the vesicles become so continuous as to render it sometimes impossible to put a pin's head between them. This is specially observed in the face, which becomes so swollen as to render the features unrecognisable. Large black scabs form, and the characteristic odour is sickening in the extreme. The mucous membranes of the mouth, larynx, and trachea, are implicated. The voice is husky, throat sore, and swallowing is difficult. Cough and dyspnoea are also *distressing, and there is delirium.*

There is thus a very marked distinction between the general appearance and symptoms of the simple and the confluent type of small-pox, and there is also a great difference in what is termed "The Secondary Fever." This term is somewhat puzzling, and hence it is necessary to explain that the high fever which precedes the small-pox eruption in either form abates when the eruption appears. This is designated "The Primary Fever." Fever again appears as the pustules mature on the eighth day of the eruption, or eleventh of the fever, and then it is termed "The Secondary Fever," which is of a typhoid or inflammatory type. As might be expected from the description of the two forms of small-pox given, it is slight in the first variety (*variola simplex*), while it is violent in the second (*variola confluens*), and very often proves immediately fatal. It may be accompanied by boils, erysipelas, or ulceration of the cornea or *membrana tympani*.

Prognosis.—In persons who have been previously vaccinated efficiently, or in whom the attack is non-confluent, the disease is rarely fatal. In those who have not been vaccinated the mortality is one in three. Further, if the papules be filled with blood (*hæmorrhagic* form of eruption) or serum, not umbilicated, and if extending, the prognosis is extremely unfavourable. Lastly, the "corymbose" form of eruption (where it groups itself into patches) is of very bad omen.

Treatment.—There is no contagion so sure as small-pox, none which acts at a greater distance, and hence prophylactic measures are of paramount importance. The sick person should be isolated, and those in attendance, before seeing other people, should change their clothes, after thorough ablution. If the disease has entered a household of the poor, removal to a special hospital is essential. Every one likely to be exposed to the contagion should be re-vaccinated, and patients who have recovered should be kept in the strictest quarantine until all crusts have fallen. *Clothes worn or bedding used should be destroyed,*

and the apartment thoroughly fumigated before again being occupied. Neither vaccination nor medicine is of any avail when small-pox is incubating or has appeared. The disease must run its course, and all that can be done is to enable it to do so under the most favourable circumstances. The patient should be kept in a cool, well-ventilated room. The diet ought to be light, and saline draughts or lemon-juice may be administered to diminish the thirst and regulate the bowels.

In the secondary fever, if it be severe, stimulants should be given, with good broth or strong beef-tea. If there is great restlessness, opium or bromide of potass and chloral do good service. If the sores are sloughy, and the system is greatly depressed, wine or brandy must be administered to sustain the strength through the attack. If the mouth and pharynx are much involved, a weak solution of iron may be employed as a gargle, and mucilaginous drinks, to which some chlorate of potass may be added.

Locally no ectrotic treatment seems of any avail. The pustules should be smeared with cold cream, or carron oil, or carbolic acid lotion (F. 56a), or with oxide of zinc and hydrocyanic acid to relieve the itching (F. 61). Iced compresses, applied wherever the eruption is abundant, are said to diminish the pain and swelling better than anything else.

When the pustules have burst, some dry powder of starch or oxide of zinc should be applied.

All scratching should be prevented, and to effect this the hands of young patients should be tied.

Warm baths may be given during the stage of decrustation every day, and the body afterwards anointed with oil or any kind of fat.

VACCINIA, OR COW-POX.

The remarkable discovery of Jenner towards the end of the last century marks an era in medicine. All experience testifies *that, while vaccination does not infallibly prevent small-pox, it yet so far modifies the disease as to*

rob it of its disgusting phenomena and sequelæ, and to render it a comparatively trifling malady. It is unnecessary to detail the process of vaccination further than to state that after the simple operation has been performed, a little redness and elevation can be detected on the second day. A vesicle with depressed centre and raised edges is seen on the fifth, and reaches its acme on the eighth day. It is now observed to be composed of a number of cells containing clean lymph and situated on a hardened base. On the ninth or tenth day these burst, and a scab is formed, which finally falls off on the twenty-first day, leaving a well-marked permanent cicatrix.

A little constitutional disturbance attends the process.

VARICELLA, OR CHICKEN-POX,

is a trifling affection, attacking infants or young children, attended with only slight fever, if with any. The eruption consists at first of pimples, which on the second day are converted into vesicles. These burst on the fourth day, and rapidly dry up. The rash first appears on the shoulders or trunk; subsequently it may attack the scalp, but it rarely involves the face. Chicken-pox has been occasionally mistaken for a mild case of small-pox. The points which should guide us in distinguishing the two are the mildness of the premonitory symptoms; the first appearance of the eruption on the trunk instead of the forehead; the papules rapidly becoming vesicular; the absence of hardness round the vesicles; and the shorter course of the disease. It seems to have an incubation of four days, and is undoubtedly contagious.

SCARLET FEVER

is eminently contagious. It is usually a disease of childhood, occurring once in a lifetime, and it derives its name from the character of the eruption, which is red, minutely *punctated*, appearing on the second day of the fever or ~~the third~~, and lasting three days. It commences on the arms

and trunk and lower side of the thighs, and thence proceeds to the face and the inferior extremities. In addition to the fever and the eruption, the disease evidences itself on the tonsils and mucous membrane of the mouth and pharynx.

It varies in severity, and hence has been divided into

Scarlatina Simplex,
,, Anginosa,
,, Maligna.

In *Scarlatina Simplex* the fever runs a simple and natural course, the eruption appearing after the usual incubatory stage, disappearing on pressure, fading on the fifth day, and terminating generally with desquamation of the cuticle on the face and trunk. This desquamation takes the form of scurf on the body, while on the hands and feet large patches of skin may come away at once. The process of desquamation may continue for days or weeks, accompanied by itching. The tongue in scarlet fever is very characteristic. At first it may be covered with a white fur; as this clears away it becomes red, the lengthened filiform papillæ project, and the organ presents a strawberry appearance. The tonsils and mucous membrane of the mouth are congested, but in a mild degree.

In *Scarlatina Anginosa* the fever is of a much more violent character, being often attended with delirium, great restlessness, and prostration. The temperature often reaches the highest point in the first twenty-four hours of the fever. This point varies much, and may, although rarely, reach 109° or 110°. The eruption may be delayed to the third or fourth day, is of a more livid colour, and it may be even patchy and evanescent. The throat symptoms are more severe, the tonsils being greatly swollen, and ulcers frequently forming on them. The neck is stiff, the sub-maxillary glands enlarged, and deglutition is difficult. Even after the eruption has disappeared, the throat symptoms do not abate in severity, as in the *simple form*.

Scarlatina Maligna is attended with marked cerebral disturbance, passing into coma, and with great vital prostration. Tenacious phlegm hangs about the mouth and throat, the teeth are covered with sordes, the tonsil ulceration may become gangrenous, and the breath is very offensive. The rash is irregular in its appearance and its continuance, and is of a livid colour. This variety, as its name implies, is usually fatal. The vital powers succumb to the strength of the poison on the fourth or fifth day. Hope may, however, be entertained if the seventh or eighth day is passed.

The dangers arising from scarlet fever, considered as a whole, do not terminate with the subsidence of the fever. Troublesome and even fatal sequelæ may result. The cervical glands may remain permanently enlarged—abscesses may form—ophthalmia result—or a muco-purulent discharge obstruct the nares, or the throat affection may spread from the pharynx up the Eustachian tube, causing disease of the ear and deafness. One of the most common and not the least dangerous sequela, however, is the affection of the kidneys, resulting in anasarca and albuminous urine. It is to be carefully observed that this result is most common in those cases where the primary fever was of a mild form. The patient has probably suffered little or no disturbance from the fever, and is perhaps exposed to cold or draughts during the stage of desquamation. The excretory powers of the skin are impeded, and increased work is thrown on the kidneys, bringing on acute desquamative nephritis (acute Bright's disease). This may be ushered in with shivering, fever, and pains in the back, or it may come on insidiously. The face becomes puffy, and this is followed by general swelling, with scanty, high-coloured, and albuminous urine. Under the microscope the urine presents blood-corpuscles, coagulated fibrin, and epithelial casts.

Anatomical Changes.—There are no distinctive post-mortem appearances in scarlet fever. The ordinary *anatomical changes* may be summed up in a single sen

tence—Erythematous inflammation of the skin, with superficial oedema; inflammation of the fauces, and congestion and catarrh of the tubules of the kidneys.

Prognosis.—The throat is the source of greatest danger. “Whenever,” says Sir Thomas Watson, “I see the glands much enlarged at the angle of the jaw, and beneath the jaw, in a child suffering from scarlet fever, I augur ill of the disease.” If, in addition, the urine is very scanty and albuminous, the danger is increased by a tendency to uræmia. When these symptoms are absent the prognosis is more favourable. In the majority of cases the dropsy disappears, though serious permanent injury to the kidney may be the result.

Treatment.—Attention to the bowels, with a slight febrifuge mixture, and rest in bed, are alone necessary in simple scarlet fever. For a drink in this, as in the severer forms, potassa. chlorat. 60 grains, in a pint of water, may be given freely. The parents should be warned to keep the patient in bed in a warm room, until the desquamation is over, and after that flannel should be worn. A warm bath may be given to bring out the eruption.

In Scarlatina Anginosa, in addition to the above, if the fever is considerable, tepid sponging, cold affusions, or wet-sheet packing, may be employed. Shaving of the head, and the application of vinegar cloths afterwards, should be insisted on. If the throat is much inflamed, and the patient is an adult, five or six leeches should be applied. If a child, hot poultices should be applied instead of leeches.

Beef-tea, wine, and ammonia, are necessary, if the patient is weak and prostrated.

The great prostration in Scarlatina Maligna necessitates from the first a stimulating treatment. Wine or brandy should be given freely. Three ounces of port wine may be given to a child, and double or treble that quantity to an adult, in the twelve hours.

The ulceration of the throat ought to be touched with *nitrate of silver*, or with a mixture of iron and glycerine.

Ammonia and bark must also be given from the commencement.

In all cases the body should be rubbed with oil, as this facilitates desquamation. Should, however, the desquamation be arrested and anasarca result, the loins ought to be cupped, and this should be followed by the constant application of hot linseed meal poultices. This arrested desquamation is frequently attended with high fever and considerable lumbar pain. The application of a few leeches is advisable in such cases, and often, in children, gives great relief and diminishes the fever. Should there be no pain, and should the anasarca be insidious, leeches are unnecessary; but the loins ought to be cupped as previously stated. It is said that tincture of aconite, at carefully regulated intervals, is very effectual in cutting short the incipient inflammation.

Hydragogue cathartics are also necessary to relieve the strain on the kidney, and of these, pulv. jalapæ co., or elaterium, seem the best. Iron, either in the form of the tincture or ferr. ammon. cit., should be ordered, in as large doses as the system can bear without producing headache or nausea (F. 89). The diet should be generous, with plenty of milk; and a uniform temperature of 60° Fahr. should be insisted on. Under such treatment the dropsy may be successfully combated, and the albumen disappear from the urine. In some cases the anasarca becomes very considerable, and is not relieved by the treatment mentioned. It may then be advisable to insert Southey's needles, with the drainage tube attached, to let out the pent-up fluid. If uræmic convulsions threaten, blood-letting, general or local, may be resorted to, together with the other means suggested under "Uræmia."

MEASLES

was long confounded with scarlet fever, and it is only since the beginning of the last century that it has been *recognised as a specific and independent disease.*

Measles is contagious, but the cause of the contagion is unknown. Susceptibility to the contagion diminishes with years, and second attacks are rare. The incubatory stage of measles, judging from the epidemic in the Fiji Islands, and other isolated instances, lasts from 10 to 12 days.

Symptoms.—Measles may be considered a catarrhal fever, with a characteristic eruption added to it, the eruption appearing first on the face and forehead, and afterwards on the trunk and extremities. The symptoms of catarrh—running at the eyes and nose, cough and sneezing, with great oppression and foul tongue—precede the eruption. The fever which accompanies these catarrhal symptoms indicates that an exanthem will follow. This fever, with a temperature it may be of 102° Fahr., lasts for three or four days, when an eruption of small circular dots, like flea-bites, appears on the forehead, spreading to the trunk, limbs, and feet. These do not remain distinct, but coalesce, until patches of a reddish colour and of irregular shapes cover the parts affected, accompanied by flushing of the face. Thirty-six hours from the commencement of the eruption the temperature is highest. The eruption lasts three days, and disappears in the same local sequence as it came.

There are two kinds of measles,—the essentially mild, and the severe.

Of the first variety there seem to be two forms—measles without catarrh, and measles without eruption.

The former attacks chiefly young persons, gives rise to little sickness, yet effectually destroys the after-susceptibility to the disease.

The latter variety is seen during an epidemic of measles, and we are justified in assuming a person to have it if the catarrhal symptoms are as severe as if the patient had a measly rash, and if the person becomes non-susceptible to the disease.

The essentially severe form of measles, popularly termed "black measles," is generally associated with the *hæmorrhagic diathesis*. Before or after the eruption of

measles, hæmorrhage occurs in various regions : in the skin, causing petechiæ or ecchymoses ; in mucous membranes, causing violent bleedings from the nose, or in organs and cavities.

The general symptoms are those of a typhoid character; sordes on the teeth, small pulse, debility and diarrhœa.

Complications.—Catarrhal pneumonia and bronchitis—an extension of the catarrh down the respiratory tract—are chiefly to be dreaded in measles. They appear after the eruptive stages, and intensify the fever and increase the danger. Of fatal augury are livid lips, cold extremities, and a rapid feeble pulse. Cerebral complications, peculiar forms of ophthalmia, dropsy, and albuminuria, are not unknown.

Prognosis.—As a general rule it may be stated that measles is essentially dangerous to very young children, and that the danger decreases rapidly with years, except in old age, when it may be fatal. Unusual sparseness or paleness of the eruption, or the hæmorrhagic diathesis, are bad omens. If the chest is only slightly affected, or not at all, we may predict a favourable result. The great danger is not in the disease, but in what it leaves behind it, such as lobular condensation or collapse of the lung, or a tendency to emphysema in after life.

Treatment.—As the greatest danger in measles is an extension of the catarrh to the lungs, all exposure to cold must be avoided. The room should be darkened, and the patient kept in bed. Milk diet, attention to the bowels, and a slight diaphoretic mixture, are all that is required in ordinary cases (F. 34).

If there is severe coryza, warm water may be drawn through the nose. Emetics are useful at the commencement to prevent cough, and cold compresses may be applied to the abdomen if diarrhœa is excessive. Should chest complications ensue, the principles of treatment to be afterwards spoken of under Acute Bronchitis should be adopted. Trousseau has recommended whipping the whole skin with nettles.

In the typhoid state associated with the hæmorrhagic atthesis, wine and stimulating expectorants are essential (72).

RUBEOLA, RÖTHELN—GERMAN MEASLES.

The term rubeola was brought into use by German physicians about the middle of the last century to designate a disease which it was considered could belong to one of the acute contagious or non-contagious eruptions, though closely resembling measles and scarlet fever.

Opinions with regard to it have greatly varied, but utterly it has been shown that it is an independent disease by distinct epidemics of it, and by the fact that while it ensures against a second attack of itself, it affords no protection from measles or scarlet fever.

Recognising it, therefore, as a contagious and essentially epidemic, and thus also specific, disease, it may so be noted that it is especially a disease of childhood, attacking indiscriminately boys and girls, and older and younger children, down to sucklings. A second attack is rare—as rare as that of measles. Its contagion is not quite so great as that of measles.

It consists of an eruption on the skin of numerous discrete blotches, from the size of a pin's head to, at the most, that of a bean, slightly raised above the level of the skin, with at times a distinct, at others a faded, border.

The spots are round or oval, and are well marked on the face, their colour being of a pale rose-red. They are seen on other parts of the body, especially on the neck, scalp, and thighs; while on the forearms, hands, and lower parts of the legs, they are not so common.

The eruption lasts usually for two days, and then disappears without any desquamation. The size of the spots is less than that of measles, the form being more round, and the colour paler.

Symptoms.—The course of the disease in the majority of cases is as follows:—After the patients have coughed

and sneezed somewhat, and manifested slight photophobia, from a few hours to a day, one notices—either at once, or after the attention has been excited by a gradually increasing temperature—the beginning of the exanthem on the face. While now the exanthem gradually spreads over the body, the temperature, if increased, becomes quickly normal again. Thus children generally object to stay in bed, and would prefer to be out of doors.

In ordinary rubeola there are no other local symptoms, except slight catarrh at times, some difficulty in swallowing, and some diminution of the appetite.

Prognosis.—Its almost feverless course makes the prognosis most favourable, but the disease may be complicated with bronchitis, and may have a fatal termination.

Treatment.—The treatment of rubeola is restricted to a suitable regimen; protection against exposure, keeping the patient in bed, if feverish, and attending to probable catarrh of the air-passages and the pharynx.

Other complications, if any, should be treated according to their nature.

DROPSY.

What is dropsy? To understand the description which follows it must be remembered that a certain amount of transudation of the serum of the blood through the veins is constantly going on in health. All closed cavities, all interstitial tissues, are kept moist during life by a continual serous exudation, which exudation again is as constantly and continuously absorbed—the absorbents being the lymphatic vessels. The continuous exudation and the equally constant absorption constitute the balance of health; but when this balance has been lost an accumulation of fluid takes place, and (dropsy) oedema is the result.

Should this accumulation occur in the subcutaneous areolar tissue, which it very frequently does, prominent and easily recognisable phenomena betoken its presence. *The part so affected is swollen; the skin loses its natural*

colour ; it becomes pale, and it may be tense and glazed. If you press firmly with your finger over the pale, tense, glazing surface, you seem to knead a doughy mass, and an impress—"pitting"—is left corresponding with the amount of pressure made. This pitting is produced by the fluid being driven out of certain of the meshes of the subcutaneous tissue into those near it, and communicating with it ; on the cessation of the pressure the fluid slowly returns, and the pit disappears. The pressure-mark, the "pitting" made, quickly disappears if the dropsy is slight, but if considerable and of long standing, the skin has lost its elasticity, and the process of obliteration is slow.

"Anasarca" is the technical term given to the accumulation of fluid in the subcutaneous areolar tissue ; while "ascites" is reserved for the collection of serous fluid within the cavity of the peritoneum, and its recognition is more difficult, and may be simulated by other abnormal conditions. "Inspection," "palpation," and "percussion," will, however, establish the diagnosis. For "inspection" shows that the abdomen is swollen and full. "Palpation" gives a sense of fluctuation apparent to the touch when the patient is laid on his back or sits upright and a hand is laid flat on one side of the abdominal wall, while a stroke is made with the other on the opposite side. The wave of the fluid is also seen visibly to cross with the impulse given. "Percussion" evidences that, in obedience to the law of gravitation, there is absolute dulness at the flanks, while the centre gives a clear tympanitic note from the air-filled intestinal coils. "Percussion" will also reveal modifications of sound, in obedience to the same law, on the change of position of the patient ; for if placed on one side, the fluid will gravitate to that, leaving the one uppermost free, and yield to the applied finger a pleximeter clearness instead of dulness as before.

This varying percussion sound affords a diagnostic sign to distinguish ascites from ovarian dropsy. For in ascites *the percussion sound varies with every change of attitude*

on the patient's part; while in ovarian dropsy it does not, being limited to the side where the tumour is, and where the history of the case evinces it had its origin; additional means for establishing a diagnosis will be afforded by the presence or absence of morbid changes in other organs, as heart, liver, or kidney.

It may be further remarked, that tympanites due to various causes may be confounded with ascites; but the percussion sound in the former is always loud and pronounced, both in front and sides. To distinguish it from distension of the bladder in pregnancy, the history of the case and the application of the catheter in the one instance, and the stethoscope in the other, are sufficient.

Should the effusion of the fluid be in the ventricles of the brain, or in the subarachnoid space, the term "hydrocephalus" is applied; when in the pericardium, "hydropericardium;" when in the pleura, "hydrothorax." The signs betokening its presence in these situations will be better understood in subsequent portions of this handbook. The term "œdema" is used when it is confined to one particular part of the areolar tissue.

The causes of the increased transudation of fluid constituting dropsy are two—

1st, Undue fulness of the veins, and consequent increased pressure on their walls.

2d, An abnormally watery condition of the blood, which gives rise to changes in the walls of the vessels, and renders them more easily permeable.

Dropsy arising from the first cause is designated "passive dropsy," as it always originates if the current of venous blood is impeded; that from the latter cause is known as "hydræmic dropsy."

"Passive dropsy" makes its appearance first on both sides of the dependent parts of the body—in the ankles and dorsum of the feet, disappearing at first during the night, reappearing during the day, when the patient leaves his bed, ultimately tending to become stationary, *and mounting upwards to legs, thighs, genital organs,*

and the coverings of the chest and abdomen. To these symptoms, at a later stage, is frequently added effusion of fluid into the peritoneum, pleuræ and pericardium. Thus it is that passive anasarca occurs in cardiac disease through the venous circulation being embarrassed and engorged on account of the constant overloading of the right heart in mitral obstruction or regurgitation, and in the later stages of aortic disease. So also it appears in advanced emphysema, when the systemic veins cannot carry the blood into the overfilled right heart. The most common abdominal causes of venous congestion are diseases of the liver (cirrhosis and cancer), and of the peritoneum (tubercle and cancer).

In dropsy from the second cause, "hydræmia," the watery condition of the blood induces morbid alterations in the structure of the vessels, by which exudation of the serum of the blood is permitted to an abnormal degree. On what does hydræmia depend? Either on an impoverishment of the blood in respect of albumen or fibrin, or on retention of water in the circulation from arrest of perspiration, or diminution of the secretion of urine.

Notably in acute and chronic diseases of the kidney is the blood found to be poor in albumen, and it is in these affections that we observe especially dropsy from "hydræmia" aggravated, when the heart is also hypertrophied, by increased blood pressure within the vessels.

Dropsy from "hydræmia" is also observed in many chronic exhausting diseases (phthisis); and when the blood is poor through bad or insufficient nourishment (purpura or scurvy). Although it may be generally said that dropsy is a concomitant, a symptom accompanying any affection which impoverishes the blood, yet there are three great kinds of dropsy, which are named after the organs implicated—cardiac, renal, and hepatic.

Cardiac dropsy, dropsy due to disease of the heart, commences in the feet and hands, and mounts upwards, ultimately becoming diffused all over the body.

Renal dropsy shows itself first in the face, especially

in the lower eyelids, which become puffy and swollen, and in its earlier stages has a tendency to shift to other parts, *e.g.* the backs of the hands.

Hepatic dropsy is localised, at first being confined to the peritoneal cavity. The portal system of veins is at first alone implicated; and hence the legs, feet, and hands may not give evidence of dropsy for some time—in fact, until the venous current in the inferior vena cava is also impeded. In an adult man primitive ascites is diagnostic of disease of the abdominal organs, generally dependent on cancer or cirrhosis of the liver.

Dropsical fluid presents the following characters:—It is thin and watery, generally of a pale straw colour, and having a specific gravity of 1008 to 1014. Its reaction is usually alkaline. It is allied to blood serum in this, that it holds in solution albumen and alkaline and earthy salts, especially the chlorides. The proportion of solids is, however, much less, and the albumen, especially, varies in quantity.

Treatment.—Without entering specially into the treatment of the different kinds of dropsy, it is to be observed that there are obvious indications—

1. To remove the fluid; 2. If possible to prevent its recurrence; and if neither the one nor the other is possible palliative measures are necessary.

Rest in the recumbent posture is of paramount importance, and the part in which is the greatest effusion must be elevated and supported. For this end raise the anasarcaous limb, and support the distended scrotum.

There are three great channels for getting rid of the effusion—the skin, the kidneys, and the intestines; and if the remedies employed to eliminate it by these organs fail, then tapping or puncturing must be had recourse to (F. 33, 37a, 27).

TUBERCULOSIS.

By the term tuberculosis we mean a certain peculiar *condition of the system*, most probably originating in the

blood, and showing itself in such conditions as scrofula, pulmonary consumption, tubercular hydrocephalus, tabes mesenterica, etc. We are ignorant of what change the blood undergoes; yet we are justified in stating that it is a deficiency of red corpuscles, and an increase of the watery portion. In some towns, 35 per cent of the death rate is due to the tubercular diathesis, and all over the country it is the cause of the direct mortality of one-seventh of the classified forms of disease.

Authorities seem to agree that the morbid state of the blood gives rise to the specific production of tubercle. After the admission of this fact, there are three widely different views of the subject:—

One is, that there is an exudation from the capillaries, as in ordinary inflammation, and that this exudation instead of forming pus, is, owing to the peculiar state of the system, transformed into tubercle.

Another is, that while there may be an exudation, this is not the whole, but the minor part of the process, for the cells of the lung-tissue tend to increase for some time, then they shrivel up and die, thus constituting tubercle.

A third view is that tubercle is the product of infective disease—this infective disease being due to the absorption of cheesy morbid products into the blood, which in some peculiar manner excite a specific inflammation which gives rise to tubercle. Some modify this opinion by saying that the caseous matter produces tubercle by a local influence, through the lymphatics, and not by a general infection.

There are two forms of tubercle—the gray and the yellow; the former consisting of minute, firm, bluish-gray granules, about the size of a millet-seed; hence the term “miliary.” Sometimes, however, they are as large as a small pea. They are generally firm, and of a semi-cartilaginous hardness.

Yellow tubercle is not semi-transparent, but opaque, its colour varying from a dirty white to a bright yellow. It *has been likened to cheese*; and as the consistence of

cheese is not uniform, in some cases being firm and tough, in others creamy and easily cut, so the yellow tubercle is firm and tough, or fluid and soft. This tubercle may be found alone in isolated masses, or a large portion of the lung may be infiltrated with it, or the large masses may be crowded together, in which case cavities may be formed by the softening of the tubercular matter.

The gray tubercle is composed of cells in a fine reticulum, and among these cells are to be seen larger ones with more than one nucleus. As the tubercle assumes more and more of the yellow appearance, the cells are observed to break up, and at length the yellow mass may be found to be composed merely of detritus, amid which a few half-shriveled small cells may be detected. From this it would appear that the yellow tubercle is a degenerated form of the gray tubercle.

What becomes of tubercle thus deposited or formed in the lung?

It may be absorbed, or it may be converted into a cheesy consistence by means of fatty degeneration, or again, it may become hardened, undergoing the change termed calcification. Around the tubercular particle or mass there is often a zone of irritation, in which there is a cell-growth in the connective tissue of the lung, and this ultimately encloses the cheesy or calcareous matter in a capsule of fibrous tissue, where it may lie for an indefinite period encysted. On the other hand, should the softened cheesy material be in communication with an air tube, it may be coughed up and the capsule of fibrous tissue may remain empty, or with merely fluid contents—a cavity, in short, in the midst of the lung tissue. The sides of this cavity may cohere, and nothing may remain of it but a fibrous nodule or scar. To establish the cure it is necessary that the patient should become so healthy as to prevent the deposition of further tubercle, or of what may become tubercle.

It is impossible to deny that tuberculosis is hereditary, and that it may also originate from breathing a vitiated

air, or from want of proper nourishment or exercise. Any disease which tends to weaken the body and impair digestion favours the development of tubercle ; and it may be further added that, whenever an organ is specially weakened by previous disease, there tubercle may form. It may also be stated that general tuberculosis has been set up in animals by the inoculation of caseous material.

What general symptoms indicate tubercle ?

A delicate white skin, which at times blushes with a rosy hue of characteristic beauty ; a coldness of the body ; in youth great precocity both in walking and talking ; a somewhat swollen abdomen ; and a strong disinclination for all fatty food.

When the tubercles are forming, or have actually formed, there is marked debility, loss of flesh, and a fever of a remittent character, as is indicated by a rise of the thermometer in the evening and a fall in the morning.

The scrofulous diathesis cannot be considered to be distinct from the tuberculous. It is simply a coarser expression of the same picture. The lymphatic glands of the neck are enlarged, sometimes even they suppurate ; the face is not so intelligent, nor has it the same transparency or regularity of feature ; the lips are frequently thick and swollen ; the nose flattened ; forehead low ; the teeth carious ; and the belly much enlarged during early life.

Paget says : " The scrofulous constitution is peculiarly liable to tuberculous disease."

Tubercular disease may be mistaken in early life for typhoid fever. The indications by the thermometer are similar ; but there is an absence of gurgling in the iliac region, of rose-coloured spots, or of characteristic pea-soup stools ; and while night sweats are associated with tuberculosis, they are unknown in typhoid fever.

Tubercular disease is often preceded by what is called strumous dyspepsia. By that term is not meant ordinary dyspepsia, pain or vomiting after taking food, but a kind of shuddering distaste for all fatty food, and which, *if taken, gives rise to nasty acid eructations, quite distinct*

from ordinary faulty digestion. Statistics show that this dyspepsia was present in 77 per cent; and out of 50 cases carefully tabulated by Mr. Hutchinson, it was found that it had preceded the chest symptoms in 33.

Prophylactic measures are necessary to prevent the transmission of tubercular disease; 1st, Marriage should be well assorted, and should not be contracted by those labouring under this diathesis. 2d, If a child is born when there is evidence of this complaint on the part of one or other of the parents, it should be entrusted to a healthy wet nurse, and should be much in the open air both during and after lactation. Cleanliness and friction of the skin should be attended to; and substances which are likely to occasion diarrhoea, such as fruits and pastry, should be avoided.

If circumstances permit, such children should be sent to a warm and equable climate until the constitution is well developed. They will there be enabled to spend much time out of doors without risk of catching cold, and thus obtain the most important hygienic factors—daily exercise and a pure atmosphere.

On the same principle sea voyages are useful. There is not much risk of catching cold at sea, and the appetite and the digestion are improved.

The appropriate treatment for each of the tubercular complaints—phthisis, tabes mesenterica, etc.—will be alluded to under the separate diseases. The general principles, however, are good nourishment, fresh air, warm clothing, and great attention paid to the digestive system. By these means, aided by appropriate medicines, it is our hope to remedy the blood disease connected with tuberculosis (F. 81).

SYPHILIS.

Syphilis is a chronic infectious disease, with different symptoms at different stages of the malady. As a *separate and distinct disease*, syphilis dates from the end of the fifteenth century, when a notorious epidemic of it

occurred in Italy, which gradually became less malignant ; and the physicians then inferred, falsely, as we now know, that it would wear itself out, and cease altogether to infect the human body. The disease is at the present day prevalent throughout the world, although its principal sites, for obvious reasons, are large seaport towns and great commercial centres.

The most common way by which syphilis can be communicated is by the genitals, as the result of sexual connection. A little red papule appears, followed by hardness and induration. A few days after this the lymphatics of the groin are enlarged, become hard to the touch, without tenderness, and freely movable beneath the skin. Shortly after the affection of the lymphatics, the papule is seen to be scaly or covered with a thin crust, which, when removed, discloses a shining surface of a bright red colour, with a scanty secretion. Meanwhile, the patient begins to feel weak and somewhat indisposed, and in the course of from six to eight weeks from the appearance of the papule, an eruption is observed on the skin, of a red colour and unattended with itching.

This is the commencement of constitutional syphilis. Simultaneously with the red eruption, or shortly afterwards, the throat begins to be inflamed ; the inflammation leading to ulceration or to the production of circumscribed flat growths on the mucous membrane. There are frequently also more or less baldness, affections of the nails, pains in the bones, inflammation of the iris or of the deeper structures of the eye.

Now, the disease properly treated may take a favourable course, with disappearance of the symptoms and restoration to health in from ten to twelve months from the time of infection. But in the majority of cases new crops of eruptions come and go on the skin and mucous membranes ; and thus we have small papules on the tongue, and scaly isolated patches of psoriasis on the palms of the hands or other parts of the body. If the constitution is weak and scrofulous, eruptions tending to

suppurate may be developed. These become encrusted and form ulcers, which finally heal by cicatrisation.

Severe ulcerations may also be developed in the throat and nasal cavities, in which latter the bones may be laid bare and the nose become permanently depressed. Tumours may form in various internal organs, especially the liver, the testicles, and the brain, and from the semi-translucent aspect which they present, especially in the quite recent state and at the growing edges, they have been termed "gummata." These "gummata" are not of the nature of an exudation, but consist of hyperplasia, increase of connective tissue elements. This increase begins in the walls of the vessels, and although at first soft and translucent, they afterwards become firmer and tougher, and dry up. Phthisis may now be set up, with albuminuria and dropsy due to amyloid degeneration of the kidneys.

Constitutional syphilis may also be communicated from local secondary lesions, as by kissing, etc., by syphilitic nurses, by vaccination when blood is taken along with the lymph of the vaccine vesicle, etc.

The syphilitic cutaneous affections may be of various kinds; probably the squamous variety is the most common, appearing in patches of a coppery colour, and having the scurf renewed as fast as it is shed.

These eruptions may generally be diagnosed as syphilitic by the fact that they do not itch; by their dull coppery colour; by their more or less circular form and grouping; and by the brownish coloration the severer forms leave behind. Syphilis is often communicated to the infant through disease of either parent. In such cases, within a few weeks or months, an examination of the nates will reveal mucous tubercles, or red patches at the buttocks, ankles, or hands. Fissures may also be observed at the lips, nose, or angles of the mouth. The child also presents, if no treatment has been adopted, a pinched, young-old appearance; the skin hangs in loose folds, and there is a history of characteristic snuffles from

birth, accompanied by a peculiar hoarse cry. As the result of this congenital syphilis the upper central incisors of the permanent teeth may have a pegshaped form and notched appearance, and one or both eyes may be affected with a lingering inflammation of the cornea (Keratitis).

Treatment.—It is doubtful if the initial lesion can be destroyed at the seat of infection, opinions varying on this important point. Experience testifies that all treatment of constitutional syphilis is futile without the aid of mercury. How this remedy acts we cannot tell. There are four modes of employing it:—

1. By inunction ; rubbing in some ungt. hydrarg. every night, after washing the part with soap and water, and stopping the remedy whenever the mouth becomes in the slightest degree affected.

2. By fumigation ; 8, 15, to 20 grains of calomel being employed for this purpose. The patient, undressed and enveloped in a blanket, being seated on an ordinary cane-bottomed chair, the calomel, placed on a small metal vessel below which the spirit-lamp is burning, is evaporated in about 15 minutes and deposited on the skin. This method may likewise be continued daily, until slight mercurialisation is produced.

3. By hypodermic injection of the perchloride. The solution used should be made by dissolving a grain of corrosive sublimate in one hundred minims of glycerine and water, mixed in equal proportions ; and of this from four to seven minims, containing respectively about the $\frac{1}{16}$ and $\frac{1}{8}$ of a grain of the mercurial salt, should be injected once daily. This injection sometimes causes considerable pain and pustular inflammation. A better method is to dissolve two grains of the perchloride in sixty minims of water. Then add to this solution forty minims of a filtered mixture of one part of white of egg and two of water. An albuminate of mercury is formed, which again is rendered soluble by the addition of a small quantity of a saturated solution of *chloride of sodium*. A clear solution is thus obtained,

and of this three minims may be injected twice daily, equal to $\frac{1}{4}$ of a grain of the perchloride. If five minims are used improvement on the syphilitic eruption will be manifested in a few days, and this without pain or any inflammation. The most appropriate places for injection are the back and sides of the thorax. This method is accurate. It is cleanly. It acts rapidly without causing salivation—about four weeks being sufficient to effect a disappearance of the symptoms.

4. By mercurial preparations internally, that one being chosen which can be continued for the greatest length of time without producing digestive derangements.

Thus pil. hydrarg. is good, or hydrarg. c. creta, or the perchloride in the form of a pill, or in a mixture in doses of $\frac{1}{4}$ of a grain (F. 1, F. 3) thrice daily. The famous liquor of Van Swieten, still largely used in France, was made by dissolving one grain and a half of corrosive sublimate in three fluid ounces of corn whisky, which can be replaced by any other strong spirit, such as rum or brandy. The dose of this solution is from one to two fluid drachms, twice daily, after meals. Iodide of potassium should be given alone for a considerable time afterwards. This remedy is specially serviceable in pustular eruptions and affections of the bones in the secondary and tertiary manifestations of the disease. If there is much anæmia, it may be combined with carbonate of ammonia or ammonia-citrate of iron. Condylomata are best treated locally by dusting calomel or iodoform over them. For Keratitis, my experience at the Glasgow Eye Infirmary induces me to speak highly of small doses of hydrarg. c. creta and quinine, with the local application at first of atropine and subsequently of calomel dusting.

The patient should avoid sudden changes of temperature, go to bed early, and wear flannel. Beer and wine may be allowed, but no spirits. The teeth should be brushed daily with tincture of myrrh, or chlorate of potass. The diet should be nourishing.

RHEUMATISM.

The word *rheumatism* is derived from *ρευμα*, a fluxion, and the disease arises from some disordered or abnormal condition of the blood. Its frequency has attracted the attention of physicians both in ancient and modern times, and much speculation has been excited as to what causes operate in determining its predisposition for the white fibrous tissue which enters into the composition of sheaths, fascia, fibro-serous membranes, and ligaments, and thus in particular affecting the joints. The heart and its coverings, moreover, are often implicated.

It is believed that the poison circulating in the blood is lactic acid. Dr. Prout first pointed out that the blood contained a superabundance of this acid; and Dr. Richardson's experiments indicate that the injection of a solution of seven drachms of lactic acid to two ounces of water into the peritoneum of a cat induces not peritoneal but endocardial inflammation (especially of the left side of the heart), and fibrous deposits on the mitral and aortic valves.

The starchy matter of the food is supposed in health to be changed into lactic acid, which then combines with oxygen to form carbonic acid and water, in which state it is excreted. If this oxidation does not take place the lactic acid accumulates in the system and rheumatic fever results.

The fibrin appears to preponderate over the saline elements of the blood during the disease. Few opportunities have been afforded of examining the state of the parts affected when the attack is acute, as few people die of rheumatism *per se*; hence the somewhat contradictory statements of different authors.

Senator's opinion as to the cause of acute rheumatism is interesting and instructive. In active muscular exercise lactic acid is chiefly formed and excreted by the *perspiration*. As the result of a sudden chill after such

exercise acting on the peripheral expansion of the centripetal nerve fibres, this excretion is arrested, and lactic acid accumulates in the system, forming the *materies morbi* of acute rheumatic fever. He supports this by stating that lactic acid, given internally for diabetes, has in two well recorded instances occasioned acute rheumatism. That rheumatism does not follow a Turkish bath he accounts for—1st, By stating that the perspiration coincident with the bath is only condensed watery vapour, not similar to that connected with active exertion; and 2d, The friction, and shampooing, and gradual cooling down, prevent the untoward results which might otherwise accrue.

Rheumatism is most conveniently divided into acute and chronic. In the former, the general and local symptoms are well marked. There is usually a feeling of coldness, want of appetite, thirst, and more or less feverishness, attendant on or caused by exposure to cold or wet. Pain is experienced in one or more joints, and is followed by inability to move, and by swelling and great tenderness. The large joints are often implicated, but the disease usually attacks the middle-sized ones. Hence the knee, ankle, wrist, and elbow are the chief seats. The disease tends to shift from one joint to another, and does not often remain fixed in the one first affected.

When the disease is thoroughly established the pain is severe, and is intensified by the slightest movement. The pulse is full and quick, and the fever is attended with a peculiar acrid, copious, and sour-smelling sweat. This sweat, which may almost be regarded as pathognomonic of the disease, seems neither to mitigate the fever nor relieve the pain. The bowels are constipated, and the urine is high-coloured, scanty, and deposits a quantity of urates on cooling.

Unfortunately the disease is not limited to the joints. It has been found that in three cases out of four of acute articular rheumatism with high fever, the heart is affected by *endocarditis* or *endopericarditis*, and the foundation is

laid for permanent chronic valvular disease. The cardiac complication is insidious, and frequently attended with no pain, and it is only discovered on examination with the stethoscope; it sets in, as a rule, about the seventh day. While pneumonia is rare, pleurisy with effusion may complicate matters.

The temperature ranges from 100° to 104° , gradually ascending for at least a week, and is subject to considerable variations. Sometimes it reaches as high as 108° or 109° , and then death quickly ensues. The amount of urea excreted is very high, reaching, in an average acute case, to 800 grains daily, fully double the standard of health.

The duration of the attack varies from three to six weeks. Relapses are common, and although five to six weeks is the usual limit, the attack may extend over some months, as it has no fixed epoch for its departure. The termination is generally in recovery, but often a joint or joints may be left stiff, or may become chronically enlarged. The average number of deaths is usually 1 in 1000. Rheumatism is not thus so serious in itself as in the after-mischief which it entails by cardiac and other complications. A variety of subacute rheumatism sometimes met with during an attack of gonorrhea is termed "gonorrheal rheumatism." In this form the disease usually locates itself in one of the large joints, as the knee, which becomes the seat of considerable effusion and swelling.

In chronic rheumatism there is subacute inflammation of one or more joints, notably the knee, ankle, and shoulders; and the pain, which is more or less constant at all times, is aggravated by changes of weather, and is accompanied by swelling. The structural changes are those of chronic inflammatory irritation, attended by thickening of the cartilaginous and synovial tissues, which thickening extends subsequently to the capsule of the joint and the neighbouring structures, but shows *little tendency to the formation of a liquid exudation,*

especially of a purulent kind. Sometimes, in consequence of this thickening, and through coalescence of the membranous elements of the articulation with the soft parts lying over them, the joints may become stiff; the cartilages may be frayed out, and ultimately worn away; abnormal adhesions may form, and permanent ankylosis result. Generally speaking, in chronic rheumatism one or more joints are constantly tender and painful and swollen. Stiffness and grating may be detected after a night's repose, and many patients are warned of approaching changes of weather by abnormal sensations in the affected joints; hence the term "prophetic joints." At the same time, it must be remembered that chronic rheumatism is peculiar to the latter half of life; that there is no attendant fever; that it never shifts quickly from joint to joint—never attacks internal organs; and these characteristics, with its tedious course, sufficiently distinguish it from the acute variety, which, however, may supervene at any time on the chronic form. The prognosis is favourable to life, but unfavourable as regards complete recovery.

A connecting link, somewhat difficult to describe, exists between the general type of chronic rheumatism in its advanced stages and a peculiar variety allied both to gout and rheumatism, and termed "arthritis deformans," "rheumatismus nodosus," "rheumatic gout," "nodular gout." It is essentially a disease of the poorer class, and prolonged exposure to cold and damp is one of the chief causes to which the malady is ascribed. Youth and childhood are exempt from it, and it grows more common after the thirtieth year, selecting the joints most continuously and severely overtasked by manual labour. The disease comes on very gradually, the earliest symptom being pain in one or more joints, which pain appears and disappears without any appreciable cause. In the course of weeks or months stiffness is apparent in the joints affected, and the articular ends of the bones become *thickened*, and grow steadily larger as the disease goes

on. With their enlargement the muscles covering the joints waste, and deformity ensues, this deformity in the smaller joints being symmetrical in character. Thus the fingers in the hands are displaced and arranged in a twisted manner over one another either towards the



Fig. 4.

thumb or little finger, so that the hand frequently becomes like a bird's claw. While the thumbs are usually spared, their homologues, the great toes on the feet, are more frequently and severely attacked than their neighbours. The annexed woodcut fairly represents the "arthritis deformans."

The course of the malady, though exceptionally slow, is usually progressive. When once fully developed it is never known to recede, though months and years may elapse before fresh joints are implicated. Roughly speaking, it runs its course without fever or much constitutional disturbance, and treatment exerts little influence on it. All the constituent parts of the articulation—cartilage, bone, and synovial membrane—are implicated in the inflammatory process, although the actual beginning commences in the cartilages, with overgrowth and subsequent ossification, especially at the free borders, leading to easily detected nodular masses of bone.

Treatment.—The varying course and duration of the

disease has clouded the actual value of medicinal agents, and hence a shifting therapeutics has characterised the treatment of acute articular rheumatism. Bleeding, mercury, and purgatives had their day, but were long ago practically abandoned, and up to a recent time the alkaline treatment was generally adopted. It is said that the heart is only implicated during the first week of the disease, when the fever is high and the urine acid, and that it is not attacked when the urine is alkaline. Hence two scruples of the bicarbonate of potass should be given every three or four hours in half a bottle of soda-water, or in an effervescing citrate of ammonia draught, and should be continued steadily until the febrile disturbance is much lessened, the pulse reduced, and the urine rendered alkaline. If the patient is robust and the urine loaded with lithates, ten minims of vin. colch. should be added to each draught.

Locally, alkaline lotions should also be applied. Half an ounce of carbonate of soda, and six drachms of liq. opii, are put into nine ounces of hot water. Flannels are soaked in this, wrung out, and applied to the affected joints, while gutta percha tissue is placed over all. A sort of local vapour bath is thus established.

Lemon juice may be given as a drink, to the extent of two or three ounces daily.

The patient should always lie between blankets. The perspiration is thus absorbed, and there is greater comfort, and less risk of catching cold. Milk slops and farinaceous food should be the diet at first, followed by beef-tea and stimulants, if there be any signs of depression; sherry taken with soda-water being, by preference, the best stimulant.

While the alkaline treatment has still its advocates, and repeated blisters find favour with a few, it is undoubtedly the case that at the present moment the therapeutics of rheumatism have been largely advanced by the administration of salicin or salicylic acid. The *result of the remedies* seems identical, although the one

is obtained from the bark of the willow-tree, and the other artificially from the action of carbon dioxide on phenol, and consists in—1st, diminishing the pain; 2d, lowering the temperature in forty-eight hours, and thus lessening the severity and duration of the disease. Neither drug should be continued after the ends mentioned have been accomplished, as their further employment is weakening to the system and retards permanent recovery. The identity of the action of the two drugs is accounted for by the fact that salicin is converted into salicylic acid after its entry into the stomach. Pure salicin seems, however, preferable to artificially prepared salicylic acid, and does not appear to cause any disagreeable head symptoms or tendency to syncope. In carrying out the treatment the following points are of practical importance:—

1st, In all cases salicin, in 25 grain doses every two hours, will lower the temperature nearly, if not altogether, to the normal in forty-eight hours.

2d, When this has been accomplished, diminish the frequency of the dose to every six hours, and finally, after two days, stop it altogether, as its further continuance is useless and depressing.

3d, If the temperature is not lowered in the time mentioned, in all probability the heart is affected, and if such should be the case the medicine should be countermanded, and a blister applied over the cardiac region.

4th, See that the salicin is properly eliminated. This is readily seen by testing with *tinctura ferri perchloridi*, which gives a purple colour to the urine, owing to the action of the iron on the salicin transformed in the system to salicylic acid. On dissolved salicin the tincture of the perchloride has no action.

This line of treatment may be supplemented by placing the affected limb in a light starch bandage after injecting morphia subcutaneously. A one per cent watery solution of carbolic acid has been recommended recently, or painting the joint with the same acid and linseed oil in the proportion of 1 to 15.

In chronic rheumatism the treatment is essentially tonic, and if possible a residence should be selected in a dry warm climate. Of other means, iodide of potassium seems the best given internally, combined with stimulating liniments of turpentine, or if the pain is severe, with local injections of morphia. *Mistura Guaiaci* has long had a deserved reputation in chronic forms of rheumatism, accompanied by great debility, in which the symptoms are relieved by warmth. If circumstances admit, and if there should be effusion, concentrated brine springs, rich in solid matter, are useful, as Aix-la-Chapelle, Aix-les-Bains, and Wiesbaden; while, if the pain is great, the more indifferent waters containing less saline matter are efficacious, as Wildbad.

GOUT.

Sydenham, the father of English medicine, who was a martyr to gout, thus congratulates himself on the fact:—

“So have lived, and so have died, great kings, and leaders of armies and fleets, philosophers, and men of varied culture, of this peculiar disease. It kills more rich men than poor, more wise than simple.”

Gout was formerly considered to be a catarrh, and derived its name from the French *goutte*, Latin *gutta*, a drop, because it was supposed to be produced by a liquid which was distilled drop by drop into the diseased part. It is now deemed a specific inflammation, attacking by preference those who live well, and especially those who are hereditarily predisposed to it. It is not unknown in London hospitals, as boatmen, butchers, and footmen are admitted with it. In Scotch infirmaries it is never seen.

It rarely attacks women. It is hereditary, and the result of living high, and eating too much, and of sedentary habits. It is specially induced by port wine, strong ale and porter, and rich food; and is rarely due to drinking gin or whisky.

Its special seat is the great toe, but it has also been

erved in the heel, the calf of the leg, the ankle, knee, wrist, thumb, and fingers.

Symptoms.—An attack of gout is said to come on most frequently towards the close of January or beginning of February. For some days the patient feels ill, and out of spirits, with bad digestion, crudities of the stomach, flatulency, and heaviness. The temper is peevish and irritable. With or without these preliminary dyspeptic symptoms, the patient may go to bed at the usual hour, and awake to find himself suffering from the most severe excruciating pain in the ball of the big toe, which is said to be similar “to dogs gnawing at a bone from which they have already eaten all that could be got.” The weight of the bed-clothes is oppressive, and no change of posture gives relief. After some hours the pain subsides, and the patient falls asleep; but on awakening he finds the joint inflamed and swollen. There is a fever and furred tongue, with great irritability and restlessness. The urine is high coloured, acid, and deficient in quantity. It is also loaded with urates and uric acid. The pain continues, with paroxysms of acuteness, for two or three days, in a first and an acute seizure; in subsequent cases, and when the attack is not primary, it may last for as many months.

After the paroxysms have subsided the urine is usually alkaline, with increase of uric acid, which, with phosphoric acid, is at first insufficiently eliminated.

A violent itching of the toe sometimes precedes the onset of gout; or it may attack the toe when the gout is disappearing, this being followed by decrease of the swelling and desquamation of the cuticle.

Gout does not terminate with one attack, though after the first seizure some years may elapse before a second occurs. The intervals between the attacks become shorter and shorter, and the patient becomes a martyr to the disease, which is now not confined to one joint, but invades the hands and feet, external ear, eyelids, and nose. Deposits of a chalky consistence, called “tophi,” are

formed round the joints, these deposits consisting of urate of soda. Chronic Gout is the term usually applied to this stage. Occasionally there is great distortion of the joints, and sometimes ulceration, with discharge of the concretions.

The same salt also invades the kidneys, being deposited first within the tubules, and subsequently in the inter-tubular tissue, leading to contraction and induration, and constituting what has been termed the "gouty kidney."

Gout at times attacks internal organs, and then it is best termed Retrocedent Gout. A French author says—"Articular gout is a disease, internal gout is death." It may thus retrocede to the stomach, giving rise to vomiting, internal pain, spasm; or to the heart, leading to disturbed action, small feeble pulse, or coma; or to the brain, causing severe headache, sluggishness, apoplexy, or paralysis; or to the lungs, originating a form of asthma, with severe cough.

Dr. Gairdner has alluded to what is termed a gouty diathesis. By this is meant a habit of body, in which, without gout showing itself externally, flying pains are prevalent over the body, which are sometimes considered neuralgic, and treated accordingly; whereas they are of a gouty nature, and are not benefited by the usual anti-neuralgic remedies.

Dr. Garrod's researches indicate that, while uric acid can be detected as a mere trace in the blood in health, in gout it exists in a much greater quantity—in fact in detectable excess, as the urate of soda. Recent investigations seem to indicate that, so long as the kidneys are able to carry away this excess, health may be maintained. If, on the other hand, the uriniferous tubules become plugged up by deposits of urates within them, the urates accumulate in the blood, and, becoming deposited in a joint or in joints, they lead to a fit of the gout. Should these renal deposits be washed away, the attack is over, and health is regained. If this does not take place, the kidneys become atrophied, and chronic gout is the result.

Diagnosis.—Gout is allied in some measure to rheumatism in its symptoms and pathology, yet differs materially from it. Gout attacks either one joint or the small joints, and usually occurs after thirty as the result of hereditary taint or high living. It is associated at first with a vivid redness, and afterwards with the formation of chalk stones; while rheumatism invades the larger joints, produces fluctuation there, occurs at any age, and is accompanied by fever and a peculiar sour-smelling sweat. Finally, rheumatism is a disease of the poor, gout of the rich, or of those who are able to afford the luxuries of the wealthy.

In gout, before and during the fit, the urates are deficient, though they become excessive afterwards; while in rheumatism the urates are always abundant.

Treatment resolves itself into what to do, and what not to do. Cold applied to the foot has been known to result in death or hemiplegia. Leeches are rarely productive of good, while general blood-letting is now abandoned.

The indications of treatment resolve themselves into a brisk purgative of calomel and colocynth, followed by a black draught. When the bowels have been freely opened, but not till then, administer colchicum, with sedatives and alkalies, or in Vichy water (F. 68).

For colchicum, either from its physiological or specific action, seems the best remedy in gout. The chief rules to be remembered in giving it are these—

1st, To give it in the form of the tincture in 30 minim doses, and never to exceed 120 minims in the twenty-four hours.

2d, Suspend the medicine immediately if it causes more than four stools in the day. It may avert a paroxysm, but it has no influence on the gouty diathesis, and even with regard to its former property, it seems in time to lose its influence, so that the patient pays dearly for his temporary immunity by a terribly severe outburst of the disease.

Locally, enjoin perfect rest. Wrap the affected part in flannel, or cotton wool, or oiled silk, or apply a poultice sprinkled with opium or belladonna, and, when the inflammation has subsided, bandage, and use slight friction. During the height of the fever the diet should be light and sloppy—milk, arrowroot, tea. When the fever abates, give beef-tea or chicken-soup, with plenty of lithia water. For retrocedent gout sinapisms and antispasmodics are necessary.

After the acute attack is over, regulate the digestive organs and bowels, and tell the patient to abstain from port, heavy sherry, fruit, ale, and porter. Claret and hock seem to do good rather than harm. The diet should not contain too much animal food, and plenty of exercise should be enjoined.

The mineral waters of Bath, Cheltenham, and Leamington, in this country, are beneficial. Those of Wiesbaden, Vichy, Carlsbad, and Aix-la-Chapelle, on the Continent, can be highly recommended.

SCURVY.

Scurvy is a disease of great antiquity. It is alluded to by Pliny, and at different times it has proved very fatal both by land and sea. It is essentially dependent on the want of fresh vegetables as an article of diet, and although it has frequently occurred on land, it is pre-eminently a sailor's disease. Other causes than that mentioned may predispose to the disease, such as great privation, bad food, a marshy soil, and defective hygienic conditions; but these by themselves will not specially originate it. That which produces scurvy is essentially the want of a vegetable diet.

While thus aware of the cause of scurvy and the means of preventing it, we are ignorant of the exact changes which it originates in the system. Different statements have been recorded by different observers. *The blood seems to undergo some change.* Older writers

stated that the blood deposited a black, muddy sediment, subsiding from a reddish serum. Later writers explain the thickened crassamentum by stating that the cohesive power of the fibrin is so much lessened as to prevent its being separated from the red corpuscles, and that this probably explains the meaning of the terms, so often mentioned, "agglutinated blood" and "thickened crassamentum." Dr. Garrod views scurvy as essentially due to the want of potash salts in the blood, through the food being deficient in them.

The symptoms of scurvy are well marked. They come on gradually with weakness, anxiety, bad breath, a sallow muddy complexion, and the appearance of blotches on the legs. Some pains of a wandering character are felt all over the body, while the temperature is lower than normal, an evidence of deficient vitality.

As the disease advances, the gums become swollen and spongy, bleed on being touched, and are said to present an appearance similar to that seen when a patient is salivated. As the disease reaches an advanced stage the teeth rot from the socket, and hæmorrhage takes place from the mouth, nose, stomach, and intestines. The debility becomes extreme, and petechiæ, developing into ulcers or ecchymoses, form on the lower extremities.

A friend who was much exposed to Arctic privation, and who was surgeon to a ship when a fatal attack of scurvy broke out, thus describes the disease:—

"The men were listless and dispirited before there were positive indications of scurvy. They could scarcely drag their legs along, and were unable to go aloft, or, if they did so, this was attended with great pain and marked debility. The pain seemed rheumatic in its character, and was always worst at night. The countenance was sallow and muddy long before the actual manifestation of the disease. The pain was at first confined to the extremities, and upon these the effusion of blood first occurred, generally in the form of small petechiæ, which afterwards developed into vibices, and sometimes into

ecchymoses. A bruise, a rebound from a rope, or any small injury, occasioned a steady development of an ulcer. Sometimes there was extensive and diffused infiltration beneath the subcutaneous and intermuscular areolar tissue.

"The limbs, especially the calves of the legs, then became as hard as a board, while above the induration the skin was either immovable and unaltered in colour, or had blood suffused under it.

"When a fatal termination ensued, it either did so from extreme exhaustion or general dropsy, unless the patient was cut off at an earlier stage by pleurisy, pericarditis, or profuse bloody diarrhoea."

Treatment.—The mercantile marine regulations of Great Britain require that on long voyages, ten days after leaving port, one ounce of lime juice, sweetened with the same quantity of sugar, shall be served out to each man daily. It is the captain's duty to see that this quantity is not only served out, but actually taken. Were these regulations carefully adhered to, doubtless scurvy would cease to exist. Unfortunately, as inquiries show, this is not always strictly followed, owing in some cases to the sailors' prejudice in considering it an emasculating beverage, and to false economy on the part of the owners in not providing a sufficient quantity. Consequently, violations of the law are not uncommon, and scurvy still exists as a sailor's disease. From the description of scurvy, and its causes, there are certain obvious indications for treatment. Rest is necessary, and the low vitality of the patient requires this rest to be in a warm atmosphere. Antiscorbutics should be administered, such as potatoes, lime juice, oranges, or the freshly-squeezed-out juice of water cresses, mustard, or horse radish. The extract of these latter plants is useless.

The diet should consist at first of soups and milk; afterwards, when the digestion has improved, fresh meat and vegetables should be given.

As a local treatment for the ecchymoses and infiltra-

tions, lotions and compresses of aromatic vinegar and spirits of camphor have a high reputation.

Dr. Garrod's theory indicates the administration of the tartrate or chlorate of potash, to prevent or cure the disease. The harm of beer is also highly commended, and of this six or eight ounces may be taken daily as an antiscorbutic.

PURPURA

seems to be dependent on a lowered vitality, the result of liver disease, affection of the spleen, syphilis, poverty, intemperance, or over-work. This lowered vitality in some way affects the blood, breaking up the red corpuscles, and allowing their contents to transude into the tissues.

The blood thus passed through the capillaries is seen as circular spots, varying from the size of a pin's head to that of a pea, being apparent first on the legs, afterwards on the trunk. They are unaltered by pressure, and have no tendency to coalesce, unless exposed to pressure, when they seem to run into one another, causing vibices or ecchymoses. In their first or circular form they are termed petechiæ.

Purpura is usually ushered in with slight fever, and with the other usual concomitants of this, viz. thirst, headache, and quick yet compressible pulse. In other instances the premonitory symptoms may pass unnoted. Not merely does the skin suffer as described, but blood may also be effused into the several mucous, and occasionally also into the serous, membranes of the body. In these effusions lies the chief danger of purpura, and the disease has thus two great divisions:—

Purpura Simplex and Purpura Hæmorrhagica.—In purpura simplex the disease runs a simple course, with little constitutional disturbance. A few spots are probably found dispersed over the body on awakening in the morning, but not aggregated. Two or three successive crops may thus form; and the disease usually subsides in from seven or eight days to a fortnight.

Purpura Hæmorrhagica is an aggravated form of the simple disorder, and in addition is specially characterised by an effusion of blood into those passages of the body lined with mucous membrane. Consequently, effusions are observed during life on the gums, tongue, and inside of the cheek ; and, if the case ends fatally, they can be seen all over the digestive tract.

Necessarily, the constitutional symptoms are more intense, the fever higher, the general oppression more apparent than in the other form ; and, in from twenty-four to forty-eight hours, spots are rapidly developed on the skin. These spots are of a bright red colour at first, but deepen into a purple red. The skin becomes tender and blotched, and scratching occasions bleeding.

The same exudation may take place into the mucous membranes from the first, but it usually follows after a few days. From the gums oozing of blood may occur, which it is sometimes difficult or impossible to check, while from the same cause there may be epistaxis, or hæmorrhage from the lungs, stomach, or bowels. Thus there may be great and fatal loss of blood, or simply weakness, anæmia, and pallor.

Diagnosis.—Purpura and scurvy may be confounded with one another. They agree in this, that they are due to some impoverished state of the blood which leads to effusion. They differ, however, as will be observed, in certain points.

Scurvy appears gradually, purpura suddenly, and with some premonitory feverishness. Scurvy is essentially characterised by sponginess and lividity of the gums, while these conditions are absent in purpura. A dusky sallow complexion accompanies scurvy, but not purpura. Further, scurvy is due mainly to the want of fresh vegetables, and can be cured by the administration of these.

No single error of diet, no single cause, originates purpura, and it can neither be prevented nor cured by the *antiscorbutic* remedies.

Treatment.—Ignorant of the cause, we can only treat purpura symptomatically. We have no specific, as in scurvy; yet, knowing that poverty, bad diet, fatigue, and defective ventilation, are great predisposing causes, it is obvious that a good nourishing diet, rest, and a well-ventilated room are essential.

Ten or twelve drops of dilute sulphuric acid, combined with one grain of quinine, may be given every two hours, or (F. 75). Tincture of the perchloride of iron in large doses seems specially serviceable in Purpura Hæmorrhagica.

When internal hæmorrhage occurs, the oil of turpentine, combined with creosote to prevent nausea, is necessary.

In cases of extreme anæmia there is danger of fatal swooning; hence the patient must preserve a horizontal attitude until all the prominent symptoms of anæmia disappear.

CHLOROSIS (*χλωρος*, green), ANÆMIA.

A high degree of pallor on exposed parts of the body in a person previously healthy and not naturally pale, has always some pathological significance; and when we perceive the lips, gums, and conjunctivæ bloodless, we say the person is anæmic. This anæmia is caused in every case either by a diminution of the volume of blood in circulation, by an unfilled condition of the capillaries, or by a deficiency in the number of red blood corpuscles.

1. The decrease of the quantity of blood may be direct, *i.e.* due to some hæmorrhage from the lungs, stomach, bowels, or uterus; or it may be indirect, caused by deficient supply or faulty assimilation of food, as in convalescence from all febrile and acute diseases, and in many chronic complaints connected with the organs of digestion. Indirectly, also, pallor is associated with loss of albumen in chronic kidney diseases, and with considerable effusion into the pleuræ, pericardium, and peritoneum.

2. Extreme pallor may be occasioned by an unfilled condition of the capillaries, due to causes preventing the heart contracting with sufficient force. Thus terror or anxiety and emotional influences blanch the face; faintness may terminate in a swoon through feebleness or temporary cessation of cardiac action; fatty degeneration of the heart, or an engorged condition of the pulmonary vessels, consequent on mitral disease, may leave the left ventricle with less blood to propel than usual, and occasion a pale characteristic yellow hue all over the skin.

3. The anæmia associated with a deficiency of the red corpuscles, with reduction of their specific gravity, and with greenness of their colour, peculiar to young females suffering from disordered or arrested menstrual flow, is termed "Chlorosis" or "Green Sickness." The time of its occurrence is usually between the ages of puberty and twenty-five, although it is also said by Trousseau to be observed at the menopause.

Symptoms.—The disease is revealed by certain symptoms, the most prominent of which are palpitation and a loss of colour, causing at first a pale sallow appearance of the surface, which may deepen into a greenish tinge—hence the name. With the palpitation there are often combined various abnormal murmurs in the heart and blood-vessels. A soft murmur following the systole is frequently heard over the base of the heart, and along the course of the ascending aortic arch. The pressure of the stethoscope on the veins of the neck, especially of the right side, evokes a peculiar hissing or droning sound (the "bruit de diable"). The respirations are frequent, becoming markedly increased by mental disturbance or bodily exertion; and the patient usually complains of shortness of breath and inability to do anything, with loss of appetite, and pain and flatulence after taking food. Menstruation is generally deranged, being sometimes scanty or irregular; frequently there is amenorrhœa; neuralgic pains in the face and head, or intercostal muscles, are often concomitants of the affection; and

there is a special liability to perforating ulcer of the stomach.

The disease tends to recovery in the space of a month or two, unless it leads to the development of phthisis or gastric ulcer. Relapses are, however, common.

Some regard chlorosis as a nervous disease; others consider it due primarily to disorders of the reproductive or digestive system. In the majority of cases, not only is the quantity of blood in circulation probably diminished, but the red corpuscles may be reduced to one half their normal relative number. In others, not their number but their hæmoglobin is diminished. There is no alteration of the proportion of white corpuscles to the red, and in this the affection in question differs essentially from Leukæmia. Virchow noticed that in chlorosis the aorta was found abnormally narrow, with thin elastic walls; that there was frequently fatty degeneration of the muscular structure of the heart, and many other abnormalities in the circulatory system. A peculiar form of anæmia, unamenable to ordinary tonic treatment, and tending uninterruptedly towards a fatal issue, has been appropriately termed "progressive pernicious anæmia." Its causes and pathology are shrouded in obscurity. It is most frequently met with in the female sex between the ages of 20 and 40, and in a relatively large proportion of cases after a rapid succession of pregnancies. The more prominent symptoms of this perplexing disease are extreme pallor, with but a small degree of emaciation; loud and persistent anæmic cardiac murmur; moderate dropsy towards the end of the disease; hæmorrhagic symptoms, particularly extravasation into the retina; and finally paroxysms of increase of temperature, the so-called "anæmic fever." From its detection until its end, the disease seldom lasts less than six or eight weeks, or more than as many months.

Treatment.—Iron is indicated in all forms of anæmia if it can be assimilated by the system, and in chlorosis, however originating, it seems a specific. It requires to be care-

fully given for weeks or months, the first great leading fact in the cure being the establishment or re-establishment of the menses. It acts by restoring the functions of health, and by giving to the blood that in which it was deficient, and consequent on this renewed vitality the menstrual flow appears. Considerable controversy as to the mode in which it should be administered has taken place. The best plan seems to be to administer it for a fortnight in the form of the Ferrum Redactum; and if this is well assimilated, and leads to no digestive derangements, it may be replaced by a soluble preparation, as the tincture of the perchloride, or ammonio-citrate, or the sulphate, as in Blaud's pill (F. 77, 78, 78 a). The remedy must be steadily persevered with, although if menstruation appears it may be discontinued for a week, and then recommenced. Even after the patient seems to have regained colour and strength, it is a wise precaution to give iron occasionally at appropriate intervals. Aloes and myrrh pills, if required, will check constipation, sometimes attendant on its use. Should diarrhoea, not constipation, be observed, nitrate of bismuth in 10 grain doses is beneficial. Many speak highly of dialysed iron in chlorosis, and trust to it entirely all through the treatment. It certainly has the recommendation of being easily taken, and of causing no blackening of the teeth, while it also seems to occasion neither diarrhoea nor constipation.

Good food, a change of air, and moderate exercise, are also essential.

RICKETS.

Rickets is a disorder of nutrition peculiar to childhood. This disordered nutrition leads to over-growth, with deficient calcification of the tissues destined to form bone, and hence the growth of the skeleton is interfered with, and transient or permanent deformity occasioned of some of its constituent parts.

The etiology of rickets has excited much controversy, and evoked many theories. It is acknowledged to be a

isease of the poor more than the rich, and especially the poor of large towns. The period for its first appearance is the majority of cases, as shown by statistics, is during the first dentition from the sixth to the thirtieth month. It seems to affect the sexes in equal proportions, and in some cases is inherited, especially from the mother. Improper feeding, authorities unanimously state, takes the foremost place as an exciting cause, and some have supposed that keeping the child too long at the breast has been the chief factor in its production, while others affirmed it to be too early weaning. Probably both views are to a certain extent correct, for too long suckling gives insufficient nourishment, while too early weaning and the substitution of unsuitable food will prove prejudicial to the child's development and growth.

Wagner's views as to the production of rickets appear sensible and practical, and present a chemico-philosophical explanation of the problem. There is, he states, an irritation of the bone-forming tissue, and it is found that phosphorus aids the irritation if lime is withdrawn from the food, for rickets can be produced in this way experimentally. Lactic acid has a similar effect to phosphorus as an irritant to the bone-forming tissue, and lactic acid in excess is found in the system of rickety children. The irritant accordingly exists in the lactic acid, and the other condition to the production of rickets, deficiency of lime, is afforded whenever the mother's milk, by prolonged suckling or weakness, becomes poor in earthy salts, or whenever the digestive derangements of the child cause these salts to be excreted more abundantly than usual, as, for example, by diarrhoea. Thus, then, by improper feeding too much lactic acid is produced, and consequently bone-forming irritation is occasioned. At the same time, the earthy matter is reduced either directly, as in cases of prolonged suckling, or indirectly, as when diarrhoea carries off the lime salts from the intestines before they are absorbed. The combination of *these two factors causes rickets, and its origin, so far as*

symptoms are concerned, is insidious. The child is fretful, and the bowels are irregular. It cries when its limbs are firmly grasped. There may be restlessness or fever at night and morning. With this restlessness and sensitiveness of all parts of the body to even gentle pressure, there is another characteristic, namely, profuse perspirations over the head and neck and chest of the child during sleep.

These symptoms may have been noted some time before the peculiar changes in the bones commence. The articular ends of the long bones swell and protrude under the soft parts, more particularly on the hands, feet, elbows, and knees. In the skull, the disease shows itself by non-closing of the fontanelles and sutures. If the child is young, the teeth do not come forward—if older, they may rot and drop out. Through the force applied to the bones by the muscles attached to them, and by the weight of the body, they become further deformed and bent, usually in an outward curve. The ribs also are depressed laterally, and cause the breast-bone to stick out like the keel of a boat. There is also often spinal curvature. Naturally, the increase of the body is delayed. The child cannot walk; or if it could walk before, it loses the power to do so. In mild cases the disease does not advance far. The morbid process is checked, and results in recovery, with, however, more or less striking deformity. In severe cases the diarrhoea increases, the weakness is extreme, and the child dies with the symptoms of marasmus and hectic fever. The younger the child, the greater the danger. The deformities of the skeleton may entirely disappear, and of those that remain two only may be troublesome in after-life—the chicken breast in both sexes, and the distorted pelvis in the female.

Treatment.—Hygienic rules must be carefully enforced. The earliest possible symptom of rickets should be watched, and if detected, the extension of the disease may be prevented. The mother's milk must be carefully attended to. As a rule, this is sufficient until the sixth

or seventh month without any auxiliary aid, but after that time it should be supplemented, and how? By the use of cow's milk, sweetened and diluted according to the age of the child. Next to cow's milk is Nestle's food and Revalenta Arabica, the main constituent of which is finely powdered lentil meal. The child should not be suckled after it is ten months old. At nights it should have a tepid bath in which there is some of Tidman's sea salt. During the day it should be carefully protected from cold and much in the open air. Lime water should be given several times a-day—a teaspoonful either in the milk or by itself. If the digestion is fairly good, some light preparation of iron may also be used, and cod-liver oil is essential in winter—the doses increasing from a teaspoonful to a tablespoonful twice daily.

The deformities of the limbs, it may be remembered, tend to disappear as the child grows older; but if not removed, the necessary remedies belong to the domain of surgery.

ERYSIPELAS.

The term Erysipelas is derived from the Greek words, ἔρυν I draw, and πελας near. It is so named from its tendency to spread.

By erysipelas we understand an exanthematous inflammation, characterised by a redness, more or less acute, of the skin, attended with hardness and swelling, and terminating generally by resolution or desquamation, though sometimes followed by suppuration, more rarely by gangrene.

It may be traumatic, following on a wound, or idiopathic, dependent on some disordered state of the constitution, and not due to any injury. In its latter phase it is a medical disease; and although it may be seen on any part of the body, it usually selects the head or face.

Like other exanthematous affections, it has a period of incubation; unlike them, however, the duration of this is

not certain, but varies from a few hours to fourteen days. Five to seven days may be taken as an average.

It often sets in with chilliness and uneasiness rather than with distinct rigors; and is attended with loss of appetite, thirst, and fever, in nineteen cases out of twenty. This general feverish condition may last a few hours or a few days, and then its local phenomena are manifested in a redness of the skin, more or less circumscribed, accompanied by acute pain, which pressure augments. The temperature of the skin is increased at the particular spot, sometimes as much as three or four degrees.

The redness does not remain localised. It spreads from point to point. If it originates in the face, the scalp is invaded, and when such is the case the individual features are not recognisable. The distended eyelids obscure the eyes, the lips are swollen, the mouth is open, speaking is sometimes difficult or impossible, the nose acquires an enormous size, and the nostrils may be dry or obstructed by blood or mucus.

Usually after a fever of three or four days' duration, and in which a temperature of 105° may be reached, the redness fades, and the blisters or small vesicles which were formed in the course of the disease present a varying appearance; in some parts being dried into a crust, while in others their contents are not yet absorbed, but are undergoing absorption.

In other cases the vesicles become dark in colour, and the skin beneath is converted into a grayish discoloured slough. Suppuration and gangrene ensue, accompanied by a low typhoid state of the system, with increased temperature, extreme prostration, and a fatal issue.

It may also prove fatal by the extension of the inflammation to the brain or its membranes, by the blood-poisoning and malignant character of the disease, or by the glottis becoming so swollen as to induce suffocation.

Erysipelas is sometimes complicated with bronchitis, acute nephritis, and pneumonia. Most English authorities believe that the disease can be propagated by actual

contact, or disseminated by means of fomites. Atmospheric conditions favour its occurrence, in what way we do not know. It has also been observed that where puerperal fever prevails there is a predisposition to erysipelas in the hospital wards.

It may be seen in infants, but after infancy it is rare until adult life. Acute attacks are most common from twenty to forty; asthenic, or less acute attacks, from forty to old age. The sexes are affected in equal proportion.

Diagnosis.—Erysipelas may be mistaken for scarlet fever, measles, or small-pox. The redness of scarlet fever is not, however, localised, and it is accompanied or preceded by throat complications. In measles there are nasal and catarrhal symptoms. A developing small-pox pustule may simulate it, but a small-pox pustule is not solitary; others may be seen in different parts of the body, and there are premonitory symptoms in small-pox, such as vomiting and pain in the back.

Erythema and erysipelas have one feature in common, viz. redness; but they differ in this, that in erythema there is no fever, premonitory or co-existent; there is no inflammation of the deeper-seated parts of the skin; there is no vesication; there is no tendency to implicate the lymphatic glands, and it does not peculiarly affect the face or head.

Treatment.—The patient, if possible, should be placed in a cool, well-ventilated apartment, and should be freed from all sources of irritation, either by officious nursing or fussy friends.

The medicinal treatment may be fitly commenced by a calomel and jalap purgative. Then give tincture of steel, in 30 or 40 minim doses, every three hours, until the fever is lowered. When convalescence is certain, diminish the doses to 20 minims thrice daily for two days; after that give bark.

In erysipelas, the result of wounds or surgical operations, tincture of aconite in five minim doses every four

hours has a deserved reputation in lowering the temperature and abating the progress of the disease.

If the cerebral symptoms are grave, cut away the hair; and if the throat is implicated, let steam be inhaled, and the throat touched with tannin and glycerine (F. 49).

The principle of all local applications consists in protecting the part affected. The old plan was to dust with flour, and cover with flannel; or to use oxide of zinc and starch, as being less clagging to the skin, and more soothing. After applications such as these, it is unnecessary to be too curious in removing the coverings to see how things are getting on.

As a more perfect covering, a mixture of castor-oil and collodion has been recommended, or painting the whole surface lightly with the nitrate of silver in solution, or with the solid stick.

In erysipelas of the leg it is advisable to draw a line of demarcation with the solid nitrate of silver on the healthy skin. This encircling band prevents the disease spreading beyond it.

Dr. Wood is in favour of tincture of iodine as a local application.

DISEASES OF RESPIRATORY ORGANS.

Accurately and intelligently to understand these, it is necessary to be familiar with the meaning and importance of certain terms which are met with in the description of diseases of the chest. The air in breathing passes into the trachea, the wall of which is rough and irregular in three-fourths of its circumference, with strongly-marked cartilaginous rings, and the current of air entering is great and quick. Below the bifurcation of the trachea the bronchi divide into smaller and smaller tubes; the cartilaginous rings become less and less distinct, until, in the terminal ramifications of the bronchi, they cease to exist, and the tubes are smooth on their internal surface.

If the stethoscope is placed over the trachea, two rough harsh sounds of equal length will be heard, the one accompanying inspiration, the other expiration, with a distinct interval between them. This is what is termed "tracheal or cavernous respiration."

Next, placing the stethoscope on the upper bone of the sternum, opposite the point at which the trachea divides into the bronchi, there is heard a modification of the tracheal breathing, the character of the sound being hollow, blowing, and soft, and with the inspiration rather longer than the expiration, and they are still separated by a slight but appreciable interval. This is "bronchial respiration" or "tubular breathing."

Again, placing the stethoscope over other parts of the chest, it will be found that the blowing character is gone, that the inspiration is soft and gentle, that the expiration immediately follows it, and is less prolonged. The combination of the two constitutes the healthy vesicular murmur.

If the person is told to speak when the stethoscope is at the different situations mentioned, it will be found that the character of the voice also varies. Thus over the trachea it seems as if he were speaking right into it, so loud and full is the sound; even a whisper can be heard. This is "pectoriloquy."

Over the sternum it is still distinct and clear, but not so loud. This is "bronchophony."

While over other parts of the chest a buzzing scarcely audible sound is heard.

These sounds, as will be seen, are significant of various diseases when heard in parts of the chest, where in health they are not detected.

The mucous membrane lining the respiratory tract is in health moist, but not too much so, else this also would give rise to disease; and as illustrating terms used, and various conditions, let us suppose a common cold is caught. *The effect of this on the mucous membrane of the respiratory tract, if it extends to it, is, first, to make*

it dry ; secondly, swollen and inflamed. The consequence is an alteration in the character of the sounds where the vesicular murmur is heard. If the larger air-tubes are alone involved, a deep-toned note will be produced like that of a person snoring in sleep, or a humming like that of a spinning top ; hence it is often described under the

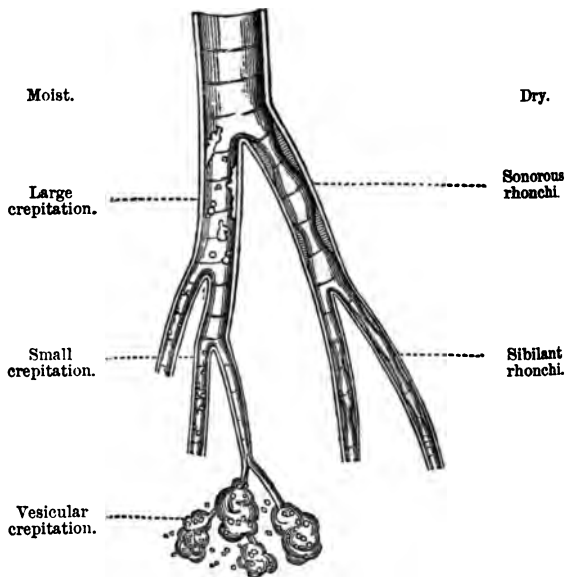


Fig. 5.

terms cooing, snoring, buzzing, or technically, "sonorous rhonchi." If the dryness extends to the smaller air-tubes, the sounds are shriller in character—piping, whistling, hissing, or technically, "sibilant rhonchi." These sounds may occur separately or together, and, if together, there is frequently a combination of the characters of both heard *on auscultation*, giving rise to a strange medley of cooing, *whistling*, piping, and snoring.

The mucous membrane in a cold, although still inflamed, does not remain dry, but becomes moist, and hence the dry sounds are replaced by moist ones. The air passes through liquids, and, in doing so, gives rise to bubbles; and to these liquid sounds the term "râles" is applied. If these are fine, and confined to the smaller air-tubes, the term "small crepitation" is used; if on a larger and coarser scale, involving the larger air-tubes, they give rise to "large crepitation." These two liquid sounds may and often do merge insensibly into one another, so that they are often heard on the same chest during the same complaint.

It will thus be observed, as the opposite diagram will show, that we have "sonorous rhonchi" and "large crepitation" as representing the dry and the moist sounds of the larger air-passages; "sibilant rhonchi" and "small crepitation," in a similar manner, being applied to the smaller air-passages.

Leaving the mucous membrane as seen in its inflammation from a common cold, we may say further that moist sounds are produced by bubbles of air traversing or bursting in a somewhat viscous fluid. Hence they may be formed, not merely in the bronchi, but in the terminal air-vesicles, or on a larger scale in cavities or ulcers of various sizes. They may thus be fine, scarcely audible, or coarse, resembling gurgling and splashing, and between these two extremes there are various gradations; hence such terms as "sub-crepitant," "muco-crepitant," etc.

The chest in health on being percussed gives everywhere a clear reply; the note on both sides being similar in similar situations, unless where on the left side the heart intervenes. In the course of some diseases it will be found that one side is more expanded or retracted than the other, and it is necessary to estimate the exact difference between them. For this purpose mark with ink the *central spots* over the spinal vertebræ and the *sternum*, and stretch a graduated tape between them on

both sides, telling the patient to hold his breath during the experiment. In cases where there is any difference note whether it increases or diminishes at regular periodical visits. If your hand is placed over the chest when the patient speaks, a distinct vibration is communicated to it. This is termed "vocal fremitus," which sensation may be altered by disease.

CATARRH.

We have commenced, and, to a certain extent, illustrated in the preliminary remarks what effect a cold has upon the chest when it affects the mucous membrane of the respiratory tract. It may, however, stop at the head, affecting only the nose (coryza) or the frontal sinuses (gravedo), giving rise at first to dryness, followed afterwards by what is termed running at the eyes or nose, and a profuse muco-purulent discharge. The general symptoms attending vary from weariness and stuffiness of the head to actual headache and some distinct feverishness, with inability to attend to ordinary duties.

The question in treatment is to endeavour to keep it at its place of origin. How are you to stop a cold? Catch it at its commencement, and feed it by an opiate. Twenty drops of tincture of opium, or ten drops of liq. morph. and eight of vin. antimon. given twice at an interval of three hours, will usually accomplish this. A simple and effective method has also been suggested—viz. to take no liquid of any kind for twenty-four or forty-eight hours. In this way the materials for flux are minimised, and it dies of inanition. A Turkish bath can also be recommended. Spirit of camphor sprinkled on a handkerchief and inhaled quickly checks the running at the eyes or nose, and may be repeated if it occurs. For "chronic sneezing," peculiar to some people in the early morning on leaving their bedrooms, or on entering a cold room, the same remedy can also be recommended, or the *inhalation* of bruised alum, 10 grs. to the $\frac{3}{4}$ of water.

The iodised steam arising from 30 to 40 drops of tincture of iodine placed in two pints of boiling water may also be inhaled night and morning for five minutes.

LARYNGITIS, ETC.

The extension of a common cold to the larynx, leading to congestion and slight inflammation of the mucous membrane, is by no means uncommon. It is evidenced by hoarseness, soreness in drawing in the breath, and a dry tickling cough, and is attended with no danger. "Acute laryngitis" is a much more severe, and fortunately rare affection; peculiar, generally speaking, to adults, and due usually to exposure to cold or wet, or inhaling vapours or dust. Oedema of the glottis, culminating in "acute laryngitis," may be produced immediately by the fumes of irritating gases, and by the accidental swallowing of boiling water. However originating, the symptoms of "acute laryngitis" are well marked. Thus, there is pain in the region of the larynx, notably at the pomum Adami, and this pain is increased by pressure externally, while internally there is a feeling of great dryness and soreness, and a sensation as if the passage was narrowed. The inspiration is protracted, wheezing, and laborious, the expiration comparatively easy, the voice hoarse or altogether lost, the cough peculiarly imperfect and brassy, and attended with hardly any expectoration. Accompanying these local symptoms of "acute laryngitis," it is found that, if not of traumatic origin, the disease is ushered in by chilliness and more or less fever. The face is full and flushed, and if the disease advances unchecked, becomes pale or livid, the pulse feeble and irregular; the restlessness is intense and accompanied by a feeling of suffocation—which actually does take place unless relief is afforded—with drowsiness, delirium, and coma. The patient dies strangled, and *this*, as the symptoms indicate, is due to the *rima glottidis* having become so swollen as to be

reduced to a mere chink, while there is inflammatory effusion into the subjacent areolar tissues. If a laryngoscopic examination can be made, the mucous membrane of the larynx will be observed to be red and swollen, being most markedly so at the aryteno-epiglottidean folds or the false vocal cords, or at the epiglottis, where all view may be obstructed. The course of the disease is rapid, sometimes carrying off the patient in twelve hours, or at all events before the fifth day. At other times recovery ensues; or the affection may pass into *chronic laryngitis*.

"Chronic laryngitis" is characterised by a sense of uneasiness and tickling in the throat, which occasions a frequent desire to cough, to clear the larynx. The expectoration is scanty, consisting of mucus, or muco-pus, and rarely contains blood. It is not usually dangerous to life, and is often the result of over exertion of the voice in clergymen, public speakers, or singers. The general symptoms are thus of little importance, unless there exist complications in the lungs or elsewhere. The laryngoscope reveals more or less congestion of the mucous membrane of the larynx—the colour varying from a normal pink or red up to a purplish red. Small pellets of mucus may be seen adhering in places to the mucous membrane, and most probably occasion the cough and irritation. Both cords may be red, or only one, or part of one.

In what is termed "laryngeal phthisis" the same local symptoms are manifested as in chronic laryngitis, with the addition of difficulty of swallowing and more violent fits of coughing; and almost complete loss of voice and dyspnoea when the disease is far advanced. Ulceration may be seen on various parts of the mucous membrane. "Tumours" or "polypi" may also form on the larynx, and give rise to symptoms like those of chronic laryngitis. They are recognised by the laryngoscope, and can sometimes be removed.

Treatment.—In laryngitis due to and accompanying a common cold, and hence better termed "laryngeal catarrh,"

it is essential that all talking or undue exercise of the voice should be prohibited; that the patient should keep to his room, which should have a uniform temperature of 63° to 66° Fahr.; that a mild diaphoretic mixture should be given (F. 31), and that the cough should be relieved by inhalations (F. 52), or by a spray solution of bromide of potassium or chloride of sodium, 20 grains to the ounce.

In "acute laryngitis," properly so called, leeches should be applied directly to the larynx of adults or the manubrium sterni of children; or hot water compresses may be employed, and covered with india-rubber cloth. Scarification of the swollen parts by a curved bistoury protected to within a quarter of an inch of the point has been followed by relief of the severe paroxysms. Should, however, marked stenosis occur, and the local means mentioned aided by inhalation (F. 31) fail to give relief, tracheotomy ought to be performed without delay; and thus rest will be allowed to the inflamed part, and relief to the engorged lungs.

For chronic laryngitis the treatment is mainly local by the inhalations previously mentioned. Chloride of zinc has been specially recommended as a local application in the proportion of 30 grains to the ounce of water, every day for a week, and afterwards on alternate days until amendment occurs. Tannin, with glycerine, is useful in phthisical, and nitrate of silver in syphilitic, ulceration. If the secretion is excessive, turpentine or creasote may be inhaled; or if the irritation is great, inhalation of hop or chloroform with the steam of boiling water may give relief. Rest, a dry climate, the careful wearing of flannel, and sometimes of a respirator, form valuable adjuncts, and in some cases are essential to the general treatment (F. 49, 52, 53). In the chronic laryngitis of plethoric persons, the springs of Carlsbad and Marienbad find special favour; while to those of a delicate constitution, and with phthisical predisposition, the warm springs of *Ems* are very serviceable. Those with a sensitive larynx

should remember that smoking is injurious, and that the use of snuff, spirituous liquors, or highly seasoned food, by irritating the mucous membrane of the pharynx, also may, and often do, awaken inflammation in the larynx. The hoarseness associated with slight laryngeal irritation peculiar to public speakers or singers may be relieved by allowing a piece of borax the size of a pea to dissolve slowly in the mouth. Taking a pod or two of cubebs pepper, or sucking a lozenge made from the same, is also useful, or the local application of glycerine of tannin.

DIPHTHERIA.

Although this disease seems to have been well known to the ancient physicians, yet its existence in England under the term diphtheria (a skin or membrane) dates back only to 1856, when it spread from France to this country. The first accurate investigations into the nature of diphtheria were made by M. Bretonneau in 1821. He considered that it was wholly a local disease, spreading by contagion through the inoculation of the soft mucous membrane with the diphtheritic secretion. He was subsequently obliged to concede that blood-poisoning is one of its essential characteristics. Much controversy has been excited as to the causation of diphtheria, which hinges round the inquiry, Is it a local or constitutional disease in its origin? Does the constitutional disease cause the local exudation; or does the local exudation originate the constitutional disease?

In support of the first hypothesis, the epidemic character of the disease has been insisted on; the grave and serious disturbance of the system, with only a few minute exudations observed on the fauces, and the impossibility of destroying the diphtheritic process by any amount of cauterisation.

In support of the second hypothesis it is urged that diphtheria fixes itself at the point of inoculation, as *shown by experiments on animals, and radiates thence*

all over the body. Thus it is seen earliest and most constantly on the parts swept over in the acts of respiration or eating and drinking, when it attacks the human subject. Further, the diphtheritic process is always associated with vegetable organisms (micrococci), and their development poisons the blood. These organisms are present in delicate ring-shaped grayish-white spots, scarcely rising above the level of the mucous membrane in the first hours of the disease, penetrating the cells of the different epithelial layers, and pushing them out. Pus and fibrinous exudation do not appear until the disease has advanced farther. Inoculation with diphtheritic material containing these micrococci on the cornea of a rabbit, produces intense keratitis, killing the animal on the fourth or fifth day by secondary general infection. So also they spread over the mucous membrane of the trachea, beset the cellular elements, crowd upon the young exudation cells and destroy them; they fill the blood and lymph vessels, jamming up the fluids and producing serous exudation. So also they appear in severe cases in the kidneys, causing inflammation with ruptured vessels and the formation of epithelial casts in the tubes.

If the membrane, on the other hand, is finely divided, passed into Pasteur's fluid, and filtered, negative results are obtained on repeated inoculation of the cornea. These micrococci are thus, it would appear, not of accidental occurrence, but are inseparable from the diphtheritic process. "Without micrococci," says Eberth, "there can be no diphtheria." The action of this matter on the tissues begins the moment it comes in contact with them, and the appearance of constitutional disturbance (fever) is brought about when these processes have reached a certain degree of intensity, and involved a sufficient extent of tissue. In artificial inoculation the grayish discoloration can be detected in from twelve to twenty-four hours; in diphtheria caught in the ordinary way, about the third day.

Without entering further into the controversy, it may

be stated that the results of diphtheritic inflammation are peculiar. Redness and swelling of the parts affected are succeeded by patches of lymph, which start from one or several points. This lymphous exudation is of a grayish ashy-white colour, and its consistence is like that of wetted parchment or damp wash-leather. It can be stripped off, leaving a raw and bleeding surface, which is again speedily covered over with the characteristic exudation. Not merely is there exudation, but there is often also on the site of the exudation marked ulceration, sloughing, or abscesses. In fact, true diphtheritic inflammation may be considered to be one of substance, involving the mucous membrane, and tending to slough. Further, it may be stated that diphtheria seems to spread by direct contagion, and that bad hygienic conditions, especially defective drainage, appear, if not actually to originate it, at least to foster its occurrence.

Symptoms.—The general features of diphtheria are prostration, restlessness, and muscular debility, with headache and nausea, and a sense of stiffness and soreness about the neck and the angles of the jaw. Further, there is often marked blanching. The local effects of the disease are manifested by the exudation first on the tonsils, and from thence spreading in different directions. Thus it may creep backwards and upwards into the posterior nares; or, more frequently, it passes over the epiglottis into the larynx and trachea. Attacking parts so intimately connected with life, the local gravity of the disease is obvious, and death may be caused by suffocation; or, on the other hand, the grave constitutional disturbance may result in death by asthenia, either directly or through paralysis of certain nerves.

The tongue is generally not much furred, the breath is foetid, saliva dribbles from the mouth, and there is great difficulty in and disinclination for swallowing. The sub-maxillary glands are enlarged, and, owing to the extension of the disease to the larynx, difficulty of breathing is a *common late symptom*. What causes this dyspnoea?

Though much controversy has arisen about this, yet it may be safely said that the best explanation is that it is due to the combined result of several causes acting together or in succession—the most important of these being the mechanical one, viz. the swollen mucous membrane on the one hand, and muco-purulent secretion on the other, obstructing the narrowed glottis. To these purely mechanical causes must be added another of subordinate importance, viz. the paralysis of the laryngeal muscles. The fever is not great. The urine is found albuminous in fifty per cent of the cases.

In non-fatal cases the specific disease is supposed to terminate on the seventh day, although the convalescence after this is slow and attended with great depression. After the complete healing of the local lesions, in the course of the second or third week of the disease various sequelæ may ensue, viz. paralysis of the soft palate and pharynx, paralysis of the muscles of the larynx, occasioning in the one case difficult deglutition, in the other impaired voice. Sometimes there are great disturbances of vision and progressive paralysis of the extremities.

The course of the paralysis mentioned is gradual and characteristic, paralysis of the soft palate and pharynx being first noticed; this is followed, either immediately or shortly afterwards, by disturbances of vision, while paralysis of the upper and lower extremities occurs later. The ordinary termination of diphtheritic paralysis is in cure, and it is also noteworthy that the muscles which were first paralysed are also the first to recover their activity. The process of cure occupies from six or eight weeks to two or three months. A fatal termination has been noted in eight to ten per cent of diphtheritic paralysis cases, but then only through intercurrent diseases, or from food entering, through paralysis, into the larynx, causing suffocation, or possibly pneumonia.

Treatment.—If, as later investigations indicate, diphtheria is at first a localised disease with after constitutional symptoms, it is obvious that treatment must be

local and general. Tearing off the membranous exudation is absolutely negatived, and even thorough canterisation has not been attended with much success. It is said that nature unaided in diphtheria tends to heal by supuration, and that in this way the false membrane is thrown off. Hence it has been suggested by Oertel to imitate nature and to establish a rapid and abundant production of pus by means of hot inhalations in quarter-hour sittings every half-hour, with nourishment supplied during the intervals, and allowing a longer time to elapse as the membranes are thrown off. The mouth should also be rinsed and the throat gargled with a solution of carbolic acid or permanganate of potash (2 grains to $\mathfrak{z}\text{i}$ of water).

The marked and rapid physiological action of pilocarpin on the salivary glands has led to its being tried lately in diphtheria, and with considerable success. It seems naturally to fit into and supplement the treatment of Oertel (F. 34a).

In the general treatment, an even temperature of 65° to 68° Fahr. is essential, with plenty of milk, ice, and cooling drinks, and with alcoholic stimulants if the powers are failing. The best internal remedy appears to be tincture of the perchloride of iron, given in large doses (30 minims every two hours in water or glycerine). Iodide of potassium and chlorate of potass have also been advocated. If the disease attacks the larynx and is advancing in severity, tracheotomy should be performed as soon as possible (F. 5, 7). Sir W. Jenner recommends, as a local application, a strong solution of nitrate of silver (1 drachm to $\mathfrak{z}\text{i}$ of water), and advises this to be used effectively, once and for all, around as well as over the patches.

For the secondary paralysis of diphtheria, tonics, change of air, and careful electric stimulation by the constant current, are recommended.

CROUP.

Two forms of croup are recognised. One form, having no inflammatory cause, no structural change, is considered to be of a nervous origin. It is termed "false or spasmodic croup," or "laryngismus stridulus." In the other form, true croup, there is a local and catarrhal inflammation of the larynx or trachea, and this inflammation is accompanied by an exudation of false membrane on the parts attacked.

Inflammatory or true croup is a disease of early life ; for although it may occur at any time between weaning and puberty, its most common epoch is in the second year of childhood. It seems to attack boys more frequently than girls.

The chief seat of croup is said to be the trachea, but it may extend from this to the smallest bronchi, and hence bronchitis or pneumonia may complicate croup. The vessels of the mucous membrane of the trachea exude a material which stiffens and forms a layer of false membrane. In some cases it can be wiped off easily, in others it requires force to remove it ; hence it is said to be thick or thin, diffuent or consistent. This stiffened croupal formation obstructs the breathing directly, gives rise to a spasmodic contraction of the muscles of the larynx, and diminishes the calibre of the air-tubes. Serious results from these causes ensue, and in addition shreds of the false membrane partially detached may produce fatal spasm. The inflammation is essentially a simple non-specific or fibrinous one, confined to the surface, and hence distinct from the diphtheritic.

Symptoms.—A premonitory feverish catarrh, such as occurs in other chest affections, may attract attention. If this catarrh be accompanied with hoarseness in young children, croup is to be apprehended. Preceded or not by this feverish cold, when croup is well established it is characterised by marked symptoms. The cough is brassy

and ringing ; the inspiration is loud and crowing ; and the fauces are observed to be red and swollen.

As the disease advances the fever increases, and from the obstruction to the passage of air and the proper arterialisation of the blood, the skin gets dusky, the feet cold, and the pulse feeble.

The character of the cough ceases to be ringing, and becomes husky. There is great irritability and restlessness, the child frequently attempting to thrust its finger down its throat to take away the obstruction. If the case proceeds to a fatal termination, the breathing becomes more and more laboured, the face pale and livid, cold clammy sweat forms, and drowsiness deepens into coma and death. Favourable symptoms are the cessation of the crowing inspiration ; the cough becoming moister, and accompanied by expectoration of false *membrana*. Croup is thus well described by Steiner :—

“ A distressing restlessness seizes the poor child. Lying or sitting in bed, he impetuously begs to be taken in the arms of his mother or nurse, and then immediately to be put back to bed again ; he tosses his hands and feet about ; springs up in bed, or convulsively grasps the side of his crib ; frequently clutches his neck, as if to remove the obstacle to his breathing, and throws off the bed-clothes ; the face expresses great anxiety, and not unfrequently is even distorted ; the eyes protrude ; the frontal veins are swollen, and the respiratory muscles taxed to their utmost capacity ; in a word, we have before us the heart-rending picture of a child nearly suffocated, tortured with the death-pang — a picture which draws out all our compassion, and brings home to us, as few other diseases do, the painful side of our calling.”

The duration of croup is usually five days.

Diphtheria and croup are closely allied, yet they are supposed to differ in this, that diphtheria is epidemic and contagious, is not so sudden in its attack, is not limited *so much* to the trachea as croup, but, beginning at the

larynx, may so spread as to involve the whole respiratory tract, and the membrane may be found in other regions ;—that, in fact, according to one theory, it is a specific constitutional disease, with throat complications ; while croup is a local disease, giving rise to constitutional symptoms.

Further, diphtheria is accompanied often by albuminuria and swelling of the submaxillary glands, and is followed by paralytic sequelæ. It is also much more asthenic than croup. The membrane in croup does not appear so often as in diphtheria. In fine, the clinical distinction between the two diseases must lie in a careful estimate of the general symptoms, the affection of the glands and kidneys, in the non-contagiousness, and partly also in the parodic appearance of the croupous inflammation.

Treatment.—Formerly leeches were always applied in cases of croup ; now the most consistent line of practice seems to use them only where children are vigorous and lethoric. Leeches cannot stop the exudation, but they seem to prevent the swelling and infiltration, which might prove fatal. They are applied to the manubrium sterni, not to the larynx, as the bleeding there may be difficult to restrain. They ought never to be applied to puny and badly-fed children. Emetics are useful, and of these the sulphate of copper is to be preferred to zinc, as tending less to weaken the system. 10 to 15 grains of the former should be dissolved in two ounces of water, and a large teaspoonful of this given every five minutes until vomiting is produced. Ipecacuanha may also be used—a teaspoonful of the wine being given at frequent intervals until the child vomits (F. 42).

If the vomiting relieves the dyspnoea and expels the false membrane, it has done good and ought to be repeated. If it fails in these objects its repetition is contraindicated. A solution of nitrate of silver should be applied at intervals of several hours to the entrance into the larynx. The bowels should also be acted on *either by an enema or calomel*. If, with the addition of

a warm bath, hot pack, or hot sponging, these means fail, after a trial of twelve hours, tracheotomy should at once be resorted to. Niemeyer says, "If it does not cure, it makes death less terrible."

The diet should consist of milk and nourishing soups. Inhalations of simple steam or medicated vapour, containing hops, chloroform, or benzoin, are often pleasantly palliative (F. 52).

When the disease has terminated favourably, the cough should be encouraged by a mixture of carbonate of ammonia and squills, in an infusion of senega (F. 44).

FALSE CROUP.

Non-inflammatory croup, to which also the names of "laryngismus stridulus," "spasm of the glottis," "spasmodic croup," and "spurious croup," have been applied, is met chiefly in scrofulous, rickety children of one or two years of age. It may originate from the brain, as in hydrocephalus; from direct irritation of the vagus or recurrent nerves; from tumours or enlarged thymus gland; from reflex causes, such as dentition, worms, improper feeding; or from mental emotion, fright, or anger.

Symptoms.—The attack is sudden, usually occurring at night and during sleep, and is characterised by one prominent symptom, dyspnoea. No air enters the glottis for the moment, and respiration seems to cease. The child struggles for breath, as if it were about to die from suffocation. There may be also convulsions and a contracted state of the flexor muscles of the thumb, fingers, and toes (carpo-pedal spasms).

The paroxysm ceases suddenly, but may be succeeded by others, and death sometimes takes place through suspended respiration, or by the stagnation of the blood in the lungs, heart, or brain. The train may be laid for serious after-results, and although termed false croup, the *disease is not free from peril.*

It is chiefly distinguished from true croup by its sudden accession and sudden departure, by the freedom of breathing between the paroxysms, and by the absence of fever, hoarseness, and any attending cough.

Treatment.—During the paroxysm place the child in a warm bath, apply a hot sponge to the throat, and, after being taken from the bath, or before it, sprinkle the face and chest with cold water. The cold sprinkling arrests the paroxysm for the time; and to avert the recurrence of convulsions (should these be present) bromide of potassium should be given.

As further prophylactic remedies regulate the bowels, lance the gums if hot and tender, and recommend fresh air and nutritious diet.

Depending, as it frequently does, on a rickety state of the system, 5 to 10 grains of the phosphate of lime may be given thrice daily in chalk mixture.

HOOPING-COUGH

is an infectious disease, which usually occurs in childhood, and is preceded by a catarrh of from three to fourteen days' duration. Succeeding this there is a peculiar cough of a paroxysmal character, which is pathognomonic of the disease. Hooping-cough usually terminates in six weeks; at times it may be prolonged from two to three months. It is not attended with much danger *per se*, but it may, and often does, originate various chest diseases, notably emphysema.

When hooping-cough has fairly determined itself, its features are very characteristic. The child has usually some premonitions of an attack, and runs to its mother or nurse for protection. Then commences a paroxysm of expiratory efforts and cough, with no intervening inspiration. The child becomes black in the face, and it would appear as if suffocation were imminent, when a long-drawn inspiration takes place, attended with a peculiar

crowding sound. This sound is doubtless due to the air entering the contracted, or even partially closed, rima glottidis. When expansion of the glottis has been completed, and the air is permitted to enter freely, the fit for the time is over. Or a succession of forcible expirations and cough alternate with crowing inspirations, until a quantity of mucus is brought up, or actual vomiting ensues.

The paroxysms occurring in the twenty-four hours vary as regards intensity. As a rule, they are worse at night. During the early stages of the disease the mucus expectorated is thick and sticky, but afterwards, with the decreasing intensity of the paroxysms, it becomes thinner, more abundant, and more easily brought up.

Listening during the intervals, you hear simply catarrhal sounds, or perhaps nothing abnormal. During the expiratory paroxysm wheezing may be detected, but during the long-drawn inspiration no sound can be heard in the lungs at all. This may be partly explained by the slowness with which the air enters by the contracted glottis, and partly, as Laennec says, by "the spasmodic contraction of the muscular or contractile fibres of the bronchi not allowing the air to enter."

Etiology.—The absence of fever in whooping-cough negatives the idea that the disease is due to inflammation; and it has been urged, from its spasmodic character, that it is probably dependent on irritation of the pneumogastric nerve by some peculiar poison. Some consider that this poison affects the cervical glands, which lie in the course of this nerve or the recurrent, causing enlargement of these, as in a similar manner the parotid is enlarged in mumps.

Fatal cases usually exhibit pulmonary collapse—the lobular pneumonia of former writers; and with this there is also evidence of bronchial inflammation.

Treatment.—The disease tends to run its course like all specific diseases, and the rule of practice appears to be met by warding off complications and treating

in, and states that the effects of this mental dietetic are admirable.

It is often asked whether patients should be allowed out in the open air? In all but acute stages this may be permitted with much benefit, especially in the warding off of succeeding tubercular disease.

INFLUENZA.

This term is of Italian origin, indicating something fluid or transient, and was first applied by Pringle in 1752 to designate a disease, epidemic in its nature and attended with catarrh, especially affecting the respiratory and digestive organs. It can be traced back with certainty only to the sixteenth century, and since then ninety epidemics of more or less severity have been described. Its universality in later years has greatly diminished. An epidemic has not been noted for some time.

In 1837 it was very prevalent in London; nearly the whole population was attacked, and the mortality was great.

The cause of the disease seems to be *sui generis*, and dependent on some poisonous influence in the atmosphere, the nature of which is unknown. Influenza rarely ends fatally, and, when it does, reveals no characteristic post-mortem features, there being simply swelling and redness of the respiratory tract, with signs of hyperæmia also in the œsophagus and stomach.

Symptoms.—The onset of the disease is sudden, hence the term "lightning catarrh." There is first a chill and malaise for several hours, followed by fever most marked at night. There is also a dry tormenting convulsive cough, with a fulness of the head, redness of the conjunctiva, throat, and mouth, and swelling of the tonsils and difficulty of swallowing. The sputa are scanty and muco-serous. There is intense prostration from the first, with dragging pains in the limbs and utter inability to move about.

The disease lasts four or five days, and usually termi-

nates in a critical sweat, with diarrhoea and an increased secretion of urine. During an epidemic of influenza the death-rate of a town is increased, especially among the aged and feeble, through its setting up acute bronchitis or inflammation of the lungs.

The great number of persons attacked and the severe prostration distinguish influenza from an ordinary catarrh, with which alone it can be confounded.

Treatment.—By rest in bed, quietness, and a stimulating expectorant, influenza is best treated. Opium, inhalations of steam, and counter-irritants, are useful for the cough. Relief will be afforded to the headache by smearing the face with fat or snuffing up a solution of morphia in the proportion of 1 to 50 or 60 of cherry laurel water. During convalescence give quinine and iron. The diet should consist of mucilaginous drinks and nourishing soups, with stimulants when the debility is great (F. 43).

BRONCHITIS

is essentially an inflammatory affection of the bronchial mucous membrane, and may be either acute or chronic.

It is caused by exposure to cold or wet, local irritation from mechanical operations, *e.g.* needle-grinding, or it may be dependent on heart disease, or associated with various constitutional affections, such as rheumatism, gout, fever, Bright's disease. It is most common in childhood and old age.

Two varieties of acute bronchitis have been recognised :

1. When the larger and medium-sized air-tubes are alone affected.
2. When the inflammation does not stop there, but involves all the bronchial ramifications—capillary or general bronchitis.

The last form is rarely seen in adults, but chiefly among young children and old people, and is frequently fatal.

Certain general symptoms accompany both varieties. *Thus, there is chilliness, fever, running at the eyes and*

nose, and general malaise. The extension of the inflammation down the respiratory tract causes irritation of the mucous membrane of the larynx and trachea, which is evidenced by a sense of tightness behind the sternum, and a tickling sensation about the windpipe. The expectoration is at first dry, and difficult to bring up, scanty, white, and frothy ; but in the course of a few days, or a few hours, it increases in quantity ; and if the attack be severe or prolonged, it becomes muco-purulent.

In the more severe form the symptoms, corresponding to the gravity of the case, are more urgent. The restlessness is great, the fever high, anxiety is depicted on the countenance, and the impaired and impeded circulation through the right side of the heart is evidenced by the livid lips ; and this lividity sometimes extends over the body, and is observed at the finger-ends. Should the disease terminate favourably, there is a gradual remission in the severity of the symptoms. The fever decreases. Respiration becomes easier, the cough less troublesome, and the expectoration freer. But if a fatal termination is likely, the symptoms increase in intensity. Unable to sit up in bed, the patient sinks exhausted on the pillow. The breathing is thus more difficult, and the lividity becomes more intense. There is not the power to bring up the mucus, which accumulates in the air-passages, and thus the patient dies from suffocation, or apnoea, due to the arrest of the circulation through the lungs in consequence of the coagulation of blood in the pulmonary arteries, and in the right cavities of the heart.

On auscultation during the first or dry stage of bronchitis we detect two coarse, rough, dry sounds all over the chest. The air-tubes are narrowed, but the air does not come through mucus ; hence the dryness of the sounds, which are termed sonorous rhonchi if the larger tubes are implicated, sibilant rhonchi if the smaller ones are involved. Percussion in this stage is clear.

When the secretion of mucus commences, these dry sounds are replaced by large bubbling in the larger air-

tubes, or small bubbling if the disease has reached the smaller tubes. This has been termed the moist stage of bronchitis, and the sounds then heard have been technically called large and small crepitations.

Percussion may now sometimes detect dulness through oedema at the base of either lung; while, if there is pulmonary collapse through tenacious mucus plugging up a bronchial tube, as not unfrequently happens, the percussion note will lack resonance over that particular part.

Prognosis.—From one-half to three-fourths of those attacked with capillary bronchitis die between the sixth and tenth days of the disease. In favourable cases improvement commences from the fourth to the eighth day. Bronchitis affecting the larger air-tubes is not dangerous. Relief generally supervenes when expectoration becomes abundant. Should this fail to return, pulmonary congestion ensues, and ultimately death. Circumstances increasing the gravity of the prognosis are very early or advanced life, the existence of some acute or chronic disease, or other complications.

Anatomical Appearances.—The morbid appearances directly indicating bronchitis as a distinct affection may be summed up in one word—redness, which may, however, vary in intensity. With the redness there is swelling, and at first dryness, of the mucous membrane. The dryness is afterwards replaced by a muco-purulent secretion.

Treatment.—Every case of bronchitis must be treated individually, as no general rule can be laid down. Yet it may be stated that bronchitis, during its early catarrhal stage, may sometimes be prevented from proceeding farther by the administration of a full dose of opium in wine or whey. If the fever is too intense for this, a hot bath, followed by a weak saline purgative, diaphoretics and expectorants, must be trusted to (F. 45); or antimonial wine, with liq. acet. ammon., for children, in doses proportioned to their years, or (F. 34).¹

* ¹ The antimonial mixture is more fully mentioned under the treatment for Pneumonia, page 120.

Bronchitis occurring in people of a gouty habit must be met by adding colchicum to the above-mentioned formula. The antimonial mixture may be omitted when the expectoration becomes freer. Steam or medicated inhalations are very grateful. When the depression is extreme, and the lividity great, carbonate of ammonia must be trusted to.

Local applications will consist of sinapisms, turpentine stupes, jacket poultices of linseed meal, etc. The diet should be fluid,—milk, beef-tea, gruel, arrowroot, in ordinary cases; and to these wine or brandy must be added in the more severe types of the disease.

Stimulants are specially necessary in the capillary bronchitis of young and old people. The general rules for their employment are indicated at page 16.

In sthenic cases occurring in adults, cupping, or the application of a few leeches to the chest, has been strongly recommended. General blood-letting has now been practically abandoned.

CHRONIC BRONCHITIS

sometimes follows the acute form, or is the result of general bad health, or the sequela of what is termed coughs and colds. It is common in advanced life, appearing in wintry inclement weather, and disappearing in summer. It may vary in its severity, at times being attended with little or no uneasiness except a slight cough and some expectoration; in other cases the cough is very harassing, especially in the morning, the expectoration copious and resembling very much the nummular sputa of phthisis, or it may simply be frothy and muco-purulent. Fresh exposure to cold or atmospheric changes may at any time convert chronic into a dangerous form of acute bronchitis.

Chronic bronchitis is sometimes dependent on certain constitutional diseases, as syphilis, gout, rheumatism. It

also specially affects workers at certain occupations ; *e.g.* knife-grinders, miners, cotton operatives, etc. Auscultation after free expectoration reveals loud harsh sounds all over the chest. These are best described as snoring. They vary in their intensity according as the air-passages are well cleared from mucus, or the reverse. In advanced cases the respiration is of a hollow blowing character, and attended with gurgling. Percussion is unaltered unless there is great accumulation of matter to be expectorated, when it may be temporarily dull over a particular spot.

Sometimes, as the result of various chronic lung affections—as bronchitis, emphysema, or interstitial pneumonia—a bronchial tube may become so dilated as to form a single pouch, like an aneurism of an artery, or a series of pouches in the same tube. This condition is termed *Bronchiectasis*, and if the cavity is near the surface, is surrounded by condensed lung, and contains air as well as liquid, the signs will be identical with those of a phthisical cavity, and can only be distinguished from it by the fact that such dilatations are usually found at the base and not the apices of the lung ; by the absence of lung tissue in the expectoration, which is abundant and foetid, and by the breath being very offensive.

A peculiar form of bronchitis, occurring either in an acute or chronic form, but much more frequently in the latter, is called variously “croupous,” “plastic,” or “fibrinous.” It is very rare, occurs more frequently in males than in females, between the tenth and the thirtieth years of life. It is attended with the ordinary symptoms of bronchitis, and has only one certain diagnostic sign, the expectoration of branching bronchial casts. Recovery in the chronic form is the rule, although the disease is apt to recur.

Treatment.—Indications for treatment vary according to the different forms of the affection, but, in all cases, are based on certain obvious principles. The patient should always be well clad, flannel being constantly worn, and he should be exposed as little as possible to

the vicissitudes of the weather. During winter, if circumstances admit, the patient should reside where the climate is mild and dry. In addition, an attempt must be made to relieve the cough, to promote or restrain free expectoration, and subdue spasm. As stimulating expectorants, vin. ipecac., squills, and senega, may be mentioned. German authorities state that hydrochlorate of ammonia is specially useful in inducing perspiration and causing an increased flow of urine. Further, it relieves the dyspnoea and liquefies the expectoration. About 45 grains should be given in twenty-four hours; a convenient method being 6 grains every three hours in a wine-glassful of water; 10 minims of sp. chloroformi and 30 of syrup render it palatable. In checking the expectoration when excessive, tincture of benzoin, dilute sulphuric acid, and the various preparations of opium, may be employed. Inhalations of steam alone, or charged with hops or with dilute hydrocyanic acid, are serviceable for the cough or spasm. The treatment for bronchiectasis can only be palliative (F. 44, 45, 21, 52). Yet turpentine has been highly recommended as actually producing a cure. In "fibrinous bronchitis" emetics are indicated after hot inhalations, to remove the branching casts in the bronchi. Iodide of potassium is also specially serviceable for this, as the casts are said to become loose even on the second day of its administration. There is no known remedy to prevent its recurrence.

EMPHYSEMA.

There are three kinds of emphysema usually described by pathologists, viz. *interlobular*, *lobular*, and *senile*. These terms explain themselves, hence we shall postpone the separate consideration of them until we come to speak of the pathology, especially as the symptoms of the three forms are the same.

Symptoms.—The patient generally has a livid or cyanotic appearance, and, if he be otherwise healthy,

this points to a deficient aëration of the blood. In this disease also we find pigeon-breast in the child, and barrel-shaped chest in the adult. The history is of great importance; for, if the patient has had chronic bronchitis, asthma, tubercle, or violent hooping-cough, or difficult establishment of respiration in childhood, we may suspect emphysema.

Dyspnoea, with a distressing feeling of oppression behind the sternum, accompanied by cough with opaque yellow expectoration, are pretty constant signs.

Physical Signs.—Regarding the percussion note there is much difference of opinion, some saying it is abnormally resonant, others that it is normal or dull (Gairdner). The respiratory murmur is deficient, and there are sonorous râles, and in rare cases crepitation. Vocal resonance is diminished, and the heart sounds are feeble or masked. The liver and heart are frequently depressed, and the latter may be pushed to one side if one lung only is affected.

Prognosis.—This is most unfavourable, for, although not so fatal as tubercular disease, emphysema is very intractable, disabling, and permanent.

Pathology.—1. *Interlobular form.*—The air vesicles may be ruptured from without as by a broken rib, or from within as by obstruction of the larynx from croup or diphtheria, causing great pressure. Thus air escapes into the connective tissue outside the vesicles, from which it may pass to the root of the lung, neck, or the subpleural tissue.

2. *Lobular, or ordinary Emphysema*, is an inflation of the terminal air-cavities, with atrophy and destruction of intervening septa from mutual pressure, ending in large cavities. This may be local or general, and the lung tissue is bulky, although pale, and collapses on section. There are three views as to the cause of this—

a. That there is a primary degeneration of lung tissue, as in senile emphysema, to be noted afterwards. It may also occur in hereditary emphysema.

b. That violent expiratory efforts with closed glottis cause increased pressure, which acts on the least supported parts of the lung; and it is in these positions that we most frequently find emphysema, viz. at the outer margin, apices, and margins of base.

c. *Inspiratory Theory*.—When a portion of lung contracts, or adhesions exist, rendering inspiration impossible, some other part of the lung must be over-distended during inspiration; hence emphysema occurs, and we often find emphysematous vesicles round cicatrices at apex, or round adhesions.

3. *Senile Emphysema* is simply an atrophy of the tissue between the vesicles, and between the infundibula.

Pulmonary emphysema, owing to the great obstruction to the pulmonary vessels, causes hypertrophy, and dilatation of the right side of the heart from its increased action, then eventually leading on to tricuspid insufficiency and general venous congestion.

The loss of inspiratory surface causes the breathlessness.

Treatment.—We can only palliate. The patient should be clothed in flannel, and avoid damp and cold. He should be very temperate in living, and if possible enjoy a warm climate. Medicinally—smoking stramonium cigarettes, or the use of arseniate of soda, or nitrate of potash, may give relief. The latter may be prepared thus (F. 51).

If the cough is very troublesome, an expectorant with ether may be given. If there is much difficulty in expectorating, an emetic of ipecac., with sinapisms to feet and calves of legs, may be tried. If indicated, any of the antispasmodics may be of temporary benefit (F. 12, 13). The injection of $\frac{1}{4}$ of a grain of apomorphia always produces free emesis in from eight to ten minutes, succeeded by perspiration and a gentle and refreshing repose. It is less depressing than ipecacuan, and seems suited for chronic bronchitis or emphysema, when an emetic is required to dislodge accumulated secretions.

In the later stages of emphysema, when the dropsy is apparent and the right heart is evidently obstructed, purging by jalap is decidedly useful. 30 to 60 grains of pulv. jalap. co. may be given every second night.

ASTHMA

seems to be essentially a spasmodic disease, the patient being healthy in the intervals, although during the paroxysm, which seldom proves fatal, suffocation seems imminent.

Symptoms.—The first invasion takes place during sleep. The patient awakens to find that he can scarcely get breath, hence he puts himself into the position that gives him most purchase for breathing. Respiration is accompanied by great wheezing, and yet hardly any respiratory murmur is heard. The patient feels that, if he could cough and expectorate, he would be relieved, but this he cannot do till the end of the paroxysm. The extremities are cold, the face livid, and the expression anxious. Pulse small and quick, but no fever. Towards the end of the paroxysm the expectoration appears, and is found to consist of frothy mucus free from blood or pus.

Such patients are usually thin and round-shouldered, and the attacks often appear to take on a periodic character. Asthma is most frequent during middle life, affecting men more than women, and being often hereditary.

Asthma is termed *idiopathic* or *spasmodic* when uncomplicated, and *symptomatic* or *organic* if it accompanies bronchitis, heart disease, etc.

Causes.—*Direct.*—As irritating inhalations, or over-eating, leading to distension of the stomach and pressure on the diaphragm.

Indirect.—Through nervous system, as by strong emotions.

Prognosis.—In itself most favourable, but by its complications, as congestion of lung, emphysema, and hypertrophy of heart, it is of much more serious import.

Pathology.—Asthma consists essentially of a spasmodic contraction of the muscular fibres of the bronchial tubes, by which means the admission of air is diminished, and the tubes become blocked up with expectoration, which it is partly the function of the muscular fibres to expel.

Treatment.—*During the paroxysm.*—The first thing is to procure fresh air, and remove any tight clothing from neck and chest. Medicinally—stramonium, in the form of cigarettes or in a pipe, frequently gives relief. Tobacco also has been found useful. Inhalation of chloroform should be tried, care being taken to stop it if the lips become blue. Burning nitre paper under the nose may do good (F. 51).

In interval.—Change of air from town to country, or *vice versa*, may be tried. Avoidance of over-eating and attention to bowels are necessary. Tonic and antispasmodic remedies may be given, and iodide of potass has been highly recommended, alone or with expectorants (F. 5, 46).

PNEUMONIA.

Acute inflammation of the substance of the lung is best recognised, probably, from its clinical history.

A person catches cold, as the saying is. The cold settles in his chest. There is also feverishness, preceded by shivering, and accompanied by gastric disorder, and sometimes by jaundice. Then the breathing becomes accelerated, although not laborious, and there is a cough; this cough causing pain, which is referred to the chest, and, as a rule, to that particular part of it which is affected. After a varying interval, the cough, which at first was hard, becomes softer, and a tough tenacious sputum is expectorated. This sputum is considered, and justly considered, characteristic of the disease. It is thick, adherent, glairy, sticking to the sides of the vessel, and through part of it a prune-juice colour is observed; or what is more often termed the rusty sputum of *pneumonia*, which a student of mine once likened to badly-mixed

Gregory's powder. The temperature, in accordance with the fever, is necessarily increased. The fever is usually intense, and may have a very high temperature (up to 105°); or there may be typhoid symptoms, with debility, dry tongue, or delirium—so much so that the affection may be mistaken for typhus fever. The pulse is frequent, and hard at first. A herpetic eruption frequently appears on the lips or nostrils about the acme of the fever. Such are the general outward signs of pneumonia. What is going on inside? In answer to this it may be stated that the disease has been divided into three stages, which it is well to be familiar with, although it is absurd to suppose that they follow one another with mathematical precision. In the first stage, if an opportunity was afforded of examining the organ attacked with inflammation, the characteristic appearance of the part involved would be redness, with a quantity of red frothy serum escaping on section. The elasticity and sponginess of the lung are diminished, but it still will float in water. The vesicles contain fluid and air, and fine crepitation is heard by the stethoscope. In the second stage the redness has yielded to solidification. The part affected has a thick heavy consistence. It no longer crepitates when pressed, and if thrown into water it sinks. Pressed between finger and thumb it breaks down, and from the appearance being like that of liver tissue it has been termed "red hepatisation." Here the fluid in the vesicles has coagulated. In the third stage resolution is taking place in the majority of cases, and the lung is coming back to its primary condition. When cut into, a great quantity of reddish or grayish fluid oozes out. Hence some call this "gray hepatisation." This stage may, however, be carried farther into diffuse suppuration, and sometimes, though rarely, into abscess and gangrene.

The change from the first to the second stage goes on rapidly, twenty-four hours or even less being sufficient. It must also be remembered that you may have one part of the lung in the first, another in the second, and another

in the third stage, so that the auscultatory phenomena, which come now to be considered, will be found to vary at different sites. The accompanying engraving is intended to show the three different stages of pneumonia, while the upper part is unattacked by inflammation. On applying the stethoscope over an inflamed lung, the healthy vesicular sound may in part be heard, with the addition of minute crepitation during inspiration. What is this due to? Very probably it is formed in the minute spaces of the bronchial terminations and pulmonary vesicles; and by some is considered due to the bubbling of air through the liquid in the vesicles, and by others to the forcible separation of the walls of the vesicles glued together by exudation, and yielding to the inspired air; the sound is best realised by rubbing a lock of hair in the immediate vicinity of the ear.

In the second stage, over the part where the lung has become dense and solid, neither the vesicular murmurs nor the minute crepitation are heard, but there is a something else probably—viz. bronchial respiration or tubular breathing. This is due to the fact that there is entering the condensed mass a permeable bronchus, and the sound is conveyed along the solid conducting medium. So, also, there may be no bronchial respiration, and no breath-sounds at all heard, because the bronchi may be filled up with accumulated secretion. Sometimes this may be set free by a cough, and the bronchial respiration may be established. Ask the person to speak while the stethoscope is applied over the site of the solidified lung, and the voice-sounds will be conducted to the ear in an intensified manner, and hence the term “*bronchophony*.” Similarly the vocal fremitus will be increased. On percussing the same part, it can also be easily understood how distinct dulness will be elicited.

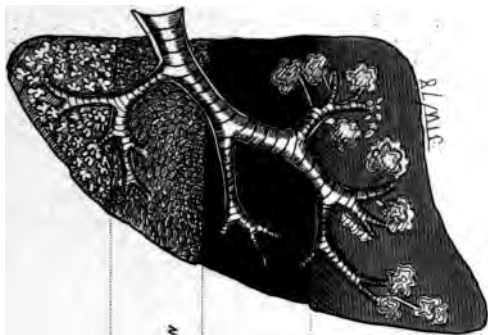
In the third stage moist sounds are detected, for the lung is permitting the air again to enter. It is the first stage on a larger and coarser scale, because the *crepitations* are heard both during inspiration and expiration.

PNEUMONIA.
Normal Lung.

1ST STAGE: ENBOURGEMENT.
CREPITATION HEARD ON INSPIRATION

2ND STAGE: COMPLETE DULNESS.
TUBULAR BREATHING.

3RD STAGE: RESOLUTION.
CREPITATION HEARD ON
INSPIRATION AND EXPIRATION.



It has been termed the *crepitatio redux*, and it is usually a happy sign in pneumonia, because it indicates that the lung is returning to its duty, permitting the air to re-enter its wonted seat. It does not come on at once, neither does it invade the whole lung at once; and at last, as health is established, it is replaced by the healthy vesicular murmur, if resolution has been thoroughly progressing.

In pneumonia the right lung is more frequently attacked than the left, and the site of the inflammation is at the base; hence the back and not the front is the proper place for hearing the phenomena indicated. Pneumonia is sometimes double. If it is not, the healthy lung, requiring to act with increased force, renders the respiration "puerile."

Should the inflammation end in gangrene, there will be an intense foetid smell of the breath, great prostration, dyspnoea, and hectic fever; and a fatal result unless the part involved is very small. Gangrene may also result from obstruction of vessels, from embolism, various septic poisons, and (it is also said) from nervous influences. The urine in pneumonia during the stage of hepatisation shows a marked diminution of chlorides. These again reappear as the inflammation subsides. It is frequently scanty, high-coloured, and tends to deposit urates. The average duration of the disease in uncomplicated cases is fourteen days; when complicated, about twenty-one.

A certain amount of bronchitis must always accompany acute pneumonia; very often also pleurisy, when the disease is termed pleuro-pneumonia.

It is necessary to mention two other varieties of pneumonia, "catarrhal" and "interstitial." Catarrhal pneumonia, by some termed "lobular pneumonia," to distinguish it from the preceding form, denominated "lobar" or "croupous," has a clinical history and post-mortem appearances of a different character, the consolidation in "lobar pneumonia" being massive, in "catarrhal" or "lobular," disseminated, limited to single lobules, and scattered more

or less over the lung-substance in patches varying in size from a hemp-seed to an egg. Catarrhal pneumonia is always associated with, generally preceded by, inflammation of the smaller bronchi (capillary bronchitis), and is a frequent complication of measles and whooping-cough, or it may follow a common cold in old or weakly persons. It may thus be considered a secondary morbid process, never originating primarily. Understood as such, what occurs in the lungs is this:—The inflammation may creep from the smaller bronchi to the air-vesicles, or it may follow pulmonary collapse, as it does in the great majority of cases. For a bronchial tube becomes obstructed, collapse of the air-vesicles beyond the obstruction takes place, and subsequently in these vesicles congestion and increased cell-formation ensue. The cells multiplying completely fill the alveolar cavity, and may, as the inflammatory process advances, undergo fatty degeneration, so as in appearance to change from a reddish-gray to a yellowish-white colour. This fatty change may lead to resolution and absorption, but frequently it is not completed, and the masses become cheesy, break down, and play an important part in pulmonary phthisis.

On section, therefore, of lungs in a recent catarrhal pneumonia, it will be understood how that the most prominent features will be pneumonic lobules scattered through its substance, as reddish-gray ill-defined nodules. Auscultation during life will thus reveal simply the sounds of capillary bronchitis, and percussion will indicate no dulness, unless the centres of inflammation have joined together over a considerable extent of the lung-substance, when areas of dulness will then be here and there detected. Its distinguishing characteristics from the first variety (lobar pneumonia), in addition to what has been mentioned, are its high temperature, its affecting both lungs, the absence of a distinct chill and of rusty expectoration; and finally, the mortality from it being *much higher*, as from one-half to two-thirds of those *attacked*.

"Interstitial pneumonia," by some called fibroid pneumonia, is rarely a primary affection, but is dependent on previous inflammation. The connective tissue of the lung becomes increased and hardened, the calibre of the air-cells is diminished and replaced by the fibroid growth. This change may follow on an unresolved pneumonia of the forms previously mentioned, or it may attend chronic phthisis or bronchitis. A lung which is the seat of fully developed "interstitial pneumonia" is diminished in size, solid, and hard to the touch, and when cut, it presents a smooth shining appearance, and gives a creaking sound under the knife. By some, the change is considered identical with what occurs in cirrhosis of the liver or kidney, and has hence been termed "cirrhosis of the lung."

Prognosis.—Pneumonia occurring in the young or very old is attended with great danger. An unfavourable prognosis must also be given when it is double, when the temperature is above 104° Fahr., and when the patient has been addicted to drinking habits, and becomes delirious in the course of the disease. Although the pneumonia, *per se*, may terminate favourably, yet through its not resolving properly, or other circumstances, phthisis may supervene. In acute catarrhal pneumonia, the prognosis depends entirely on the circumstances attending the development; occurring with measles or hooping-cough, the prognosis is favourable. With scarlatina having a temperature above 105° it is very unfavourable, especially if there is also a feeble pulse and a tendency to coma. In interstitial pneumonia the prognosis as to time is good, as people with it may live for many years, and suffer only from dyspnoea. Any intercurrent affection will, however, have a direct influence on the prognosis of a disease which can scarcely be regarded as an independent affection.

The treatment must be regulated by the stage in which the pneumonia if croupous is observed. If only seen in the stage of resolution, when returning crepitation is

heard over the greater part of the affected lung, it may be safely inferred that nature, aided by tonics or assisted by an occasional expectorant, will complete the recovery. On the other hand, when seen early, when the skin is hot, the pain severe, the dyspnoea intense, and when the face is flushed and anxious, there can be no doubt that the application of twelve leeches to the affected side, followed by the internal use of antimony, is attended with marked benefit. Antimony is a cardiac sedative, and at the same time it lowers the respirations. So acting in diminishing the force and the frequency of the heart's pulsations and the intensity of the work thrown on the lung, it places the organ, as the surgeon sets the fractured limb, in a condition of comparative rest. It is not necessary to push the drug on the heroic principles advocated by Rasori, for it will be found that if given in $\frac{1}{8}$ of a grain as in 25 to 30 drop doses of vinum antimonial. every two hours, its purpose will be effected. Thus I give

R. Vin. Antimon. ℥ss.

Sp. Chloroform. ℥iii.

Aqu. Camphoræ ℥v.

A tablespoonful every two hours. In the course of twenty-four to forty-eight hours the pulse will be diminished in volume, the temperature decreased, the skin bathed in perspiration, and the expectoration freer. The same mixture is continued for the next two or three days, but instead of every two hours it is taken every four hours. Then with returning resolution it may be stopped, for its object has been accomplished, and ammonia and bark may be substituted. If the plethoric symptoms are not so manifest, and if the case is only seen in the stage of consolidation, I still advocate the antimonial treatment, but without the leeches. The advisability of giving stimulants must be judged of by the individual peculiarities of the case. If the patient is a broken-down and dissipated man, or has been accustomed to take them freely, the necessity for their

administration is indicated from the first. In other cases common sense and prudence must guide the practitioner.

Locally, hot linseed-meal poultices ought to be applied and carefully attended to. The temperature of the room should be kept uniformly at 60° Fahr., and beef-tea, given at regular intervals, should form an essential part of the dietary.

Cold bathing or cold applications to the chest have found considerable favour in Germany. In addition to the general treatment laid down in acute bronchitis, Dr. Flint strongly advises sulphate of quinine in full doses as an antipyretic. In catarrhal pneumonia occurring in the progress of measles or other affections of children, Juergensen recommends a uniform moist atmosphere by means of steam so contrived as to pass over the mouth of the patient, and in addition, baths of 77° to 86° Fahr., followed by cold affusion if the fever is high, and carbonic acid poisoning, from non-expansion of the lungs, manifest. Still further to dislodge the bronchial secretion, a mixture of oil of aniseed, senega, and ammonia is advised, with "Nestle's food" and wine to support the strength.

PLEURISY.

Pleurisy was the designation given at one time to every pain connected with the chest, but now it is exclusively applied to inflammation of the serous membrane lining the walls of the thorax and investing the lungs. It may thus be either single or double, according as one side or both sides are affected. It may also be either acute or chronic.

Symptoms.—In acute pleurisy the attack is usually sudden, and there may be no premonitory chill, as in pneumonia. Pain is, however, generally felt, acute and lancinating, chiefly in the mammary region, and is increased by cough and inspiration. On account of the pain, the respiration is voluntarily impeded. The cough

is short and dry. These local symptoms are attended with headache, anxious countenance, hot skin, and rapid pulse. The temperature does not rise so high as in pneumonia, nor decline so rapidly, but tends to fluctuate.

In the early stages, if the stethoscope be applied to the place where the pain is felt, the opposed pleural surfaces are heard grating against one another, and producing what is termed "the friction sound." The surface of the pleura is roughened by the effusion of a thin layer of lymph on it, which can be felt on post-mortem examination as a rough coating, like fine chamois leather. This sound only lasts a short time, for, should resolution have occurred, it ceases, and the investing membranes glide over one another as in health; or adhesions may have formed between them; or, as most frequently happens, an effusion of fluid has taken place into the cavity. The fluid in the pleural sac may be purulent, constituting what is termed "empyema," and this pus may seek an exit either internally or externally. If internally, an opening is made into the same lung through the pulmonary pleura, and the matter is evacuated by expectoration; or it may make its way externally through an intercostal space, and usually at the most dependent part. If the opening thus formed does not close, we have what is termed bronchial fistula if the opening is internal, or parietal fistula if external. In this way air may reach the pleural cavity, and thus we have pneumothorax, or if serum as well, hydropneumothorax. The word Pyopneumothorax applies to the cases where pus and air exist at the same time in the pleural cavity.

The effused matter, consisting of serum or pus, gives well-marked indications of its presence. On percussion we find dulness corresponding to the extent of the effusion, and this dulness may be complete or partial according as the fluid fills the whole or only part of the pleura. The dulness, also, if the effusion is partial, will vary with the position of the patient, the fluid gravitating to the most dependent part, except where it is

PLEURITIC EFFUSION.



- A.—VOCAL RESONANCE INCREASED ABOVE (BRONCHOPHONY);
- B.—DIMINISHED COMPARATIVELY BELOW (EGOPHONY);
- C.—PUERILE BREATHING ABSENT.
- D.—HEART DISPLACED.

PNEUMOTHORAX WITH EFFUSION.



- A.—PERCUSSION TYPANITIC ABOVE, DULL BELOW (B.)
- C.—METALLIC TINKLING, SPLASHING ON SUCCUSSION.
- D.—AMPHORIC BREATHING HEARD OCCASIONALLY.

bounded by adhesions, in which case no change of level occurs on the patient changing his posture.

The lung is pressed back against the vertebral column, and if this compression is so complete as to prevent any air entering it, on auscultation we can hear no breath-sounds at all. If, however, we listen at the back, where the compressed lung is in part acting and allowing air to enter, or, more definitely, in the interscapular region of the affected side, we may detect increased resonance and bronchial breathing; the bronchial or tubular breathing being like that of pneumonia, only softer to the ear and more superficial. Sometimes, when the patient speaks, the voice appears faint, distant, and trembling, like the bleating of a goat; it is then termed "ægophony."

At the outset of the illness the patient lies on the sound side, probably to diminish the tension and increased pain of the affected side; but as the disease advances and effusion ensues, this position cannot be retained, because the effusion would then involve not only compression of the lung on the affected side, but compression also of the sound lung, through the displacement of the mediastinum; hence it is seen that the patient lies on his "back," or on the "affected side," if the pleurisy is single and the effusion great. Moreover, the effusion, if great, may cause considerable displacement of organs. Thus the diaphragm may be depressed and the liver displaced downwards if the effusion is on the right side. In extreme cases on the left side the heart may be so shifted as to be seen beating on the opposite side. The unaffected lung in single pleurisy is thrown into increased activity, and the sounds becoming more distinct occasion what is termed "puerile breathing." The intercostal spaces may also be flattened or even bulged out, while the intercostal muscles do not rise and fall as in the healthy state. The measurement of the affected side will also show an increase as compared with the sound one.

Duration.—This varies; sometimes amounting to five or six days, sometimes to as many weeks.

Termination.—The effusion may never have become purulent, but may be absorbed, as indicated by a gradual diminution of the dulness, and if there are no adhesions the lung will resume its natural size and functions. If it is bound down by adhesions we may find that it will not proportionately expand, but shrink in comparison with the other side, or empyema and hectic fever may result; or there may be an aggravation of the symptoms, swelling of the hands, dyspnoea, and death; or the disease may pass into the chronic state.

Varieties.—Usually pleurisy is single, but the disease, although primarily affecting one side, may spread to the other, constituting double pleurisy. Sometimes there is little fever, little pain, no dyspnoea, and yet an extensive pleuritic effusion—latent pleurisy. Diaphragmatic pleurisy is characterised by pain in the hypochondriac region reflected to the clavicles, great dyspnoea, cough, intense fever, and vomiting.

Diagnosis.—Pneumonia and pleurisy have certain things in common, viz. pain in the side, fever, dyspnoea, oppression, cough, and dulness on percussion. The dulness in pleurisy is, however, more complete, the elasticity of the lung being more fully lost, and it is associated with absence of respiration, of voice sound, and of vibration; and further, there is no fine crepitation and no rusty sputum as in pneumonia. Cancer of the lung presents physical signs closely resembling those of a pleural effusion. It does not, however, cause enlargement of the affected side, and it is also a disease so rare as practically to be left out of account, unless the history and the cancerous cachexia, and the probably "red currant jelly expectoration," point to its occurrence. To tell whether the fluid is still serous or has degenerated into pus (empyema), is a point of great practical importance in regard to treatment; for, if purulent, medicinal absorbent treatment is valueless. This point can only be determined by general considerations, unless an experimental puncture by the *aspirator* is resorted to; yet a history of a long continu-

ance of the disease, and of shiverings, night sweats, hectic fever, and rapid emaciation, indicates the probabilities of empyema. Intercostal neuralgia may simulate the first stage of pleurisy, but is distinguished from it by the pain not being aggravated by breathing, and by the absence of friction murmur and fever.

Prognosis.—Favourable if single and primary, unfavourable if the effusion becomes purulent. If secondary to other diseases, it may so complicate matters as to be the immediate cause of death. As will be seen from the foregoing remarks, the pathology of pleurisy may be shortly stated thus :—

1. Some redness of the pleural surfaces.
2. Exudation partly serous and partly fibrinous, the fibrin being deposited on the inflamed surfaces ; and as inflammation goes on this fibrin is replaced from below upwards by an inflammatory growth comparable to granulation tissue.
3. The fluid may be absorbed, and thus the two granulating surfaces coalesce, obliterating the cavity.
4. The fluid may increase and become purulent, as previously noted.

The treatment most consistent with the sketch of pleurisy given seems to be this :—If the case is seen in the early friction stage, the application of leeches to the seat of pain, followed by hot poultices and the administration of a purgative, the latter to be succeeded by a soothing expectorant mixture (F. 43). Opium hypodermically, or by the mouth, is of much benefit, especially if combined with calomel. Controlling the movements of the affected sides by straps of sticking-plaster has been found useful in preventing effusion. If effusion has already taken place, then it is necessary to promote absorption. Of the remedies most useful for this, special mention must be made of a pill containing squill, digitalis, and mercury, given thrice daily (F. 36). This should be followed by the iodide of potassium, with rest in bed,

nourishing diet, wine, and the local application of small blisters, or the unguent. iod. hydrarg. (F. 5).

Should the effusion not be removed by these means, or should it have become purulent, as indicated by hectic fever and sweats, paracentesis by the pneumatic aspirator should be performed. The site selected for the operation should be, according to Bowditch, at the inferior angle of the scapula, between the ninth and the eleventh ribs. Fraentzel, however, suggests that the position is inadvisable, because of the danger of wounding the diaphragm, and because punctures in this situation, from a thick layer of fibrin intervening, prevent the fluid from being withdrawn. He prefers to follow Laennec's advice, and puncture between the mammary and axillary lines, selecting the fifth interspace on the left, and the fourth interspace on the right, side, in order to keep clear of the liver. The patient should assume a semi-recumbent position, the aspirator should be carefully tested, to see that it is acting properly, and the fluid should be drawn away slowly, rather by repeated operations at intervals of a day or days, than all at once. How much should be withdrawn at a time? and what should be done if the fluid is purulent and of an offensive odour? My answer to the first question is, From 70 to 90 ounces, if the fluid comes away freely, unstained by blood; and to the second, Do not trust to the aspirator; let the pus out, insert a drainage tube, and wash the cavity daily with a solution of carbolic acid, two grains to the ounce.

CHRONIC PLEURISY.

As in simple pleurisy, the pleura is full of fluid to a greater or less degree, but this fluid is milky or purulent, and often exists with a pulmonary fistula. If the pleurisy be double, it is frequently associated with tubercle.

Symptoms.—As in acute pleurisy after exudation, there is absence of thoracic vibration, complete dulness, and loss of the respiratory murmur, which may be replaced

by tubular or bronchial breathing. The side affected remains immovable, the intercostal spaces are filled up, while any other position than lying on the back, or the side affected, is impossible. When chronic pleurisy is primitive, *i.e.* does not follow on an acute affection, it does not announce itself by any local pain; the fever, if any, is irregular, with little or no dyspnoea. In fact, the pleura may sometimes be full of fluid without the patient being conscious of this. After this mode of invasion, tuberculosis is apt to set in with weakness and enfeebled digestion, followed by hectic fever and night sweats.

Treatment should be tonic—cod-liver oil, syrup of the iodide of iron, and good nourishing soup and beef-tea.

Should there be no indication of tuberculosis or cancer, should the effusion seriously endanger the patient's life by suffocation, and should it fail to be removed by the means mentioned, or by absorbent or diuretic treatment, it is advisable to perform paracentesis (F. 35, 36, 37).

Addenda to Chronic Pleurisy.—The condition termed pneumothorax may here be briefly alluded to. Injuries may lead directly to this, as from fractured ribs or blows; but in the great majority of cases the air is admitted as the result of the bursting of a small cavity into the pleura in the progress of phthisis. Sudden severe pain, faintness, and dyspnoea, characterise this occurrence at first, and afterwards the face and lips become blue and swollen. The percussion note is abnormally clear on the affected side, or dull; there is no true vesicular murmur, though bronchial breathing may be detected along the spine. With inspiration, voice and cough amphoric sounds will be heard, and also a metallic echo; auscultating, while an assistant uses two coins, one as a hammer, the other applied to the chest as a pleximeter, may elicit a sound clear and ringing, of varying intensity and loudness, and sometimes not unlike the chime of a small clock. Hence it has been called "the bell sound." As there is generally fluid with the air, it may be detected at the base of the pleura by dulness on percussion, by metallic tinkling

occasioned by the fall of a drop of fluid on the fluid at the bottom, and by a splashing sound being sometimes produced when the patient is shaken. This latter fact, known to Hippocrates, has sometimes led to its being termed, not merely succussion, but "Hippocratic succussion."

As the consequence of disease of the heart, kidney, or liver, obstructing the circulation, there may be a passive effusion of serum into both pleural cavities, and the condition termed "hydrothorax" is established. It is not a disease of the thorax *per se*, but simply marks the advance of the general dropsy to the lungs.

PHTHISIS, PULMONARY CONSUMPTION,

is the most fatal and most common disease to which the human race is liable; it may occur in any country, and may attack either sex at any age. It may be hereditary or acquired, and may run an acute or chronic course. Acute phthisis is, however, rare.

Phthisis (chronic), as we generally observe it, is shown by certain general and local symptoms.

The general symptoms are first dyspeptic; want of appetite, a faulty digestion, a marked aversion to all forms of fatty food, may for some time precede the cough, this being at first dry, and most severe at night or early morning, but is afterwards accompanied with a clear, sticky expectoration, or it may be tinged with streaks or dots of blood. If the expectoration of blood is abundant, vomiting accompanies the cough; hence the term "vomiting of blood" so often employed by patients. In inquiring into the character of the blood, it is necessary to remember that if it proceeds from the lungs the succeeding coughs will generally bring up portions of blood which remain behind; the colour becoming darker and darker, and finally turning to a dirty brownish-red. If from the stomach, the blood comes away by a single act of vomiting, and then follow black-coloured discharges from the

bowels. There is no fixed pain, but often a dull, varying, aching feeling between the shoulders or below the clavicles. Exertion, such as walking quickly, or going upstairs, occasions dyspnoea, while hurried breathing is a constant symptom. Loss of weight and emaciation from the faulty digestion, or from the accompanying fever, as evidenced by increased temperature and quickened pulse, form valuable diagnostic signs. Sometimes a red line is seen on the gums, and the fingers are often club-shaped and the nails curved.

Some, if not all of these symptoms are found in the first stage of phthisis, and accompanying these, and evidencing the existence of the tubercular deposit in the lungs, are marked local symptoms. The deposit affects, as a rule, the apex of one lung at first, and on percussion in the supra-spinous or supra-clavicular region, want of elasticity is detected, or actual dulness. The expiration is prolonged, and accompanying the inspiration a feebleness or jerking is heard, or dry clicking. When the exudation has become more marked, and has set up more pulmonary irritation, localised evidence of this is shown by sub-crepitant bubbling sounds, or by bronchial or tubular breathing. It should, however, be borne in mind that phthisis may have taken perfect hold of the system and yet there may be an absence of physical signs, or only the slightest indication of them. In such cases the thermometer is of great service, as it will indicate an increase of the evening temperature over the morning to a greater or less extent.¹

In the second stage, with which, for convenience of description, the third or last stage is also included, we find the general symptoms to have markedly increased in severity. There is distinct flattening above and below the clavicles of one or both sides. The fever is more pronounced, and is hectic in its type. The system is

¹ This increase I have found most marked on the affected side by half to one quarter of a degree on the Fahr. scale. Thus, if the left lung is implicated and the right is not, the thermometric evening indication will be—right, 99·2; left, 99·6.

further weakened by profuse night sweats and diarrhoea. The cough is frequent and irritable, often giving rise to vomiting; the appetite capricious, and digestion greatly impaired. The expectoration is thick, yellow, sinking in a kind of thin glairy liquid, pellet-shaped, or, from its resemblance to a coin, called "nummular;" later on it loses this character, and becomes distinctly purulent, sometimes having a greenish colour and most offensive odour.

Should a fatal issue result, as usually happens in this stage, the exhaustion becomes more profound, the night sweats more severe, and finally, swelling of the feet and ankles is often observed.

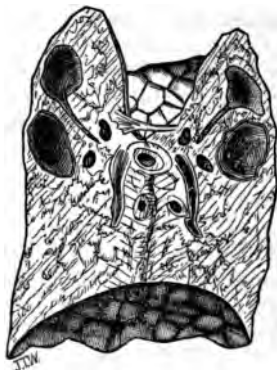


Fig. 6.—SECTION OF LUNG, SHOWING CAVITIES.

The tubercles formed in the first stage have softened and broken down, leaving cavities. The layer of lung forming the wall of the cavity or cavities is usually thick and solid. Hence, on percussion, the sound is dull, or if there is a free communication with the open bronchi and the mouth, there is a cracked-pot sound (*bruit de pôt fêlé*). In the course of advanced phthisis pneumothorax may occur. Its production is due to perforation of the pleura, through the extension of the degenerated

tubercle, and thus air is permitted to enter the pleural cavity. The characteristic symptoms of pneumothorax are mentioned at page 127.

On auscultation gurgling is heard, caused by the air bubbling through liquid. Should the cavity be dry and hollow, "cavernous or amphoric respiration" will be present. These sounds may also often be combined if the cavity contains fluid at its lower part, while above it is to a great extent dry. The vocal resonance indicates "bronchophony" or well-marked "pectoriloquy."

If the student should be asked what are the signs of a cavity, say at the apex of the lung, the answer should be, Dulness over a limited area, or probably a cracked-pot sound—"gurgling," "cavernous breathing," and "pectoriloquy."

Frequently a murmur is heard below the clavicles, especially on the left side, following the first sound of the heart, and is presumed to be due to adhesion at the apex of the lung. The shrinking thus occasioned produces a bending, an alteration in the direction of the artery (subclavian), and the blood flowing through the narrowed part gives rise to the murmur.

The elastic fibres of the lung-tissue can at times be detected in the sputa by mixing them with an equal quantity of caustic soda in distilled water 18 : 100. Boil the mixture, frequently stirring, then add three or four times its bulk of water, and allow it to stand in a conical glass. The deposit contains the elastic fibres. It is sometimes difficult to decide between the probabilities of incipient phthisis and acute bronchitis. As aids to diagnosis, the following points, gleaned from what has been told under the two diseases, are of practical importance as bearing on the cough, pain, temperature, and history. For the cough of phthisis is at first dry and hacking, followed by the expectoration of thin mucous fluid, sometimes streaked with blood; while that of bronchitis begins suddenly with fever and coryza, and is attended with *expectoration of a frothy, generally abundant, mucourulent character, not often blood-stained.* The pain in

the chest in phthisis is generally wandering, although sometimes it is most felt below the clavicle of one side, or between the shoulders. In bronchitis there is no actual pain, but a feeling of tightness behind the sternum, which feeling is aggravated by coughing. In phthisis the evening rise of temperature is always apparent, while in bronchitis there is no marked difference at night. The physical signs of the disease in phthisis are localised to the apex of one lung, and are persistent there, while in bronchitis they exist equally all over the chest, are of temporary duration, and subside gradually.

Further, the hereditary history and the general appearance and loss of flesh and strength accompanying phthisis, will materially aid, if present, in deciding in favour of that disease.

ACUTE PHTHISIS (GALLOPING CONSUMPTION)

is a rare disease, and runs a rapid course. It seems dependent on tubercular degeneration following catarrhal pneumonia; the pneumonic consolidation, instead of undergoing resolution, breaks down into soft cheesy matter, with the formation of cavities of various sizes, at times all over the chest.

It is attended with a sudden onset, shivering followed by a high fever, pain, cough, dyspnoea, profuse sweatings, rapidly increasing weakness and prostration. The pulmonary mischief is evidenced by hurried breathing, and small and large crepitations not localised but general.

In the only two cases I have seen, death occurred in less than five weeks. This is about the usual duration of the disease.

Treatment.—The general treatment is indicated under tuberculosis. With regard to other remedies, cod-liver oil has deservedly been the sheet-anchor of the profession for many years. It affords the greatest amount of nourishment in the smallest form, and should be commenced in teaspoonful doses at first, mixed with lime-water, and gradually increased. It can also be given in

the form of an emulsion (F. 82a). The oil may also be rubbed in externally, especially if the stomach cannot digest it. Glycerine can sometimes be taken with advantage in dessert or table-spoonful doses thrice daily, either alone or with the syrup of the iodide of iron in a bitter infusion. Pancreatic emulsion has by some been considered beneficial. Malt extracts have recently met with considerable favour. For children and young people butter eaten with bread is an excellent substitute for oil; they will increase in weight, if it is given in large quantities daily, say from two to five ounces. Adults who cannot digest oil often improve on fresh cream, to which is added some salt, sugar, and rum. Counter-irritants, as croton oil, or iodine paint, may also be employed over the front of the chest.

It is better to allay the cough with inhalants than cough mixtures. The hop inhalation can be specially recommended (F. 52).

Opium, or some of its preparations, forms the essential ingredient in all useful cough mixtures, and must be given when it would be cruel and impossible to dispense with these (F. 71). The injection of ergotine is to be recommended in severe hæmoptysis, with gallic acid internally (F. 19), ice-cloths over the chest, and the sucking of ice. To control the diarrhoea chlorodyne is useful. And to prevent sweating the hypophosphite of lime or the injection of atropine is highly serviceable. I have seen much benefit following the use of the hypophosphites in the early stages of hereditary phthisis (F. 82). Recently in acute phthisis the following treatment has been recommended:—Careful nourishment, stimulants in small quantities at regulated and repeated intervals, the subcutaneous injection every night of $\frac{1}{16}$ of a grain of atropine, with antipyretic remedies in the form of iced cloths to the abdomen, 10 to 30 grains of quinine in one dose daily; or one grain of quinine combined with half a grain of digitalis and a fourth of a grain opium, as in "Niemeyer's pill."

Alcohol may be given freely in all stages of the disease.

It tends to check the destructive process ; it frequently allays the cough better than anything else ; and it does not raise the temperature. If the case is not too far advanced, and the patient can afford it, a sea voyage should be tried ; and, if circumstances admit, a residence for some time in a warm and equable climate, such as Torquay, Hastings, Mentone, Nice, Algiers, or Madeira, or the pure and elevated atmosphere of Davos may be selected if there is manifest arrest of the disease.

CANCER OF THE LUNG

is usually of the medullary form, and originates from the bronchial glands—thence invading the substance of one or both lungs. It may, however, be primary. The symptoms are obscure—the more prominent being dulness on percussion, dyspnoea, tubular respiration, and the expectoration of sputum of “red currant jelly” character and consistence. Rapid emaciation ensues, and ultimately death by exhaustion, through the malignant nature of the disease and from its involving by pressure, nerves, blood-vessels, and other structures. Its course is rapid, the mean duration being 13·2 months. Out of ten cases which have come under my observation, I have only detected “the red currant jelly expectoration” twice ; but in all, there was paralysis of the left recurrent laryngeal nerve, and great hoarseness.

DISEASES OF CIRCULATORY ORGANS.

ANGINA PECTORIS.

The introduction of this term into medical nomenclature is due to Dr. Heberden, who in 1768 first described the disease, and stated that the sense of strangling and anxiety with which it is attended may make it not *improper to call it angina pectoris* (anguish of the breast). *It is a rare disease.*

Etiology.—Some consider it merely neuralgic, commencing for the most part in the pneumogastric nerve, and spreading in different directions. Militating against this theory is the fact that it seems brought about by what disturbs the heart's action, viz. mental emotion and bodily exertion, and especially that it is so often suddenly fatal. Dr. Jenner believes it due to ossification of the coronary arteries, disordering the nutrition of the organ. This does not, however, account for the sudden pain. Generally speaking, it may be said to be essentially connected with fatty degeneration, ossification of the coronary arteries, or some valvular disease of the heart.

Symptoms.—The attack is sudden and without warning, occurring sometimes when walking quickly up a hill, or after early breakfast. The pain is referred to the cardiac region, and is intense in its character. It may radiate from the heart, as its central origin, to the neck, back, left shoulder, and arm. The suffocating feeling with which it is accompanied gives rise to the fear of impending death. The countenance is pale and covered with sweat; the pulse feeble, small, and fluttering; while consciousness is unimpaired. Increased arterial tension has been found to be notably associated with angina pectoris, and the attack is supposed to be due to spasmodic contraction of some, if not all, of the small systemic and pulmonary vessels.

Fortunately the attack does not last long, generally only a few seconds, but it may be prolonged even an hour. It is paroxysmal in its character, and may be evoked by unknown exciting causes. It is a disease of middle life or advanced age, and is more common in men than women.

The prognosis is necessarily grave, and, sooner or later, death ensues in the course of a paroxysm.

Treatment.—There can be little doubt that the inhalation of nitrite of amyl is the best remedy for the paroxysm of *angina pectoris*. The inhalation of two to three drops

relaxes the increased arterial tension, and, observation shows, in a few seconds causes the face to flush and the head to appear full. The heart seems to give one strong beat, and from a condition of perfect agony there may be in a moment complete repose. The instantaneous relief experienced by its use has induced many patients to carry about with them glass tubes of nitrite of amyl,—each containing 4 grains,—and at the slightest warning of an attack, to break one, and inhale the amyl sprinkled on a handkerchief. Comparative freedom from attack is thus enjoyed, and walking exercise may be cautiously tried. While the efficacy of amyl is acknowledged in averting the paroxysms, common sense dictates a careful prophylactic treatment: the life should be tranquil, the diet moderate, abstinence enjoined from wine, spirits, and tobacco, and all constriction in dress removed from the neck or the abdomen. As the attacks often occur while walking against the wind or ascending a mountain, common sense and prudence interdict such exercises.

HYPERTROPHY OF THE HEART.

As a preliminary inquiry to the subject of hypertrophy of the heart and other cardiac affections, it may be asked, "What is the area of superficial cardiac dulness in normal cases?"

To answer this the student should percuss very carefully, employing pen and ink to dot out the results of his investigations on the chest. It will then be found that he has a map roughly triangular in form, the right side of the triangle being the mid-sternal line from the level of the fourth chondro-sternal articulation downwards; the hypotenuse being a line drawn from the same articulation to a point immediately above the apex beat; the base being a line drawn from immediately below the apex beat to the point of meeting between the upper limit of liver dulness and the mid-sternal line.

How are the valves situated in the area thus mapped

out? From above downwards the pulmonary comes first, then the aortic, then the mitral, and lastly the tricuspid; and in regard to their depth from the surface, the tricuspid is the most superficial, then the pulmonary, next the aortic, and deepest of all is the mitral orifice. Their exact anatomical arrangement is as follows:—The tricuspid orifice extends from the junction of the fourth left costal cartilage with the sternum, behind that bone to the articulation of it with the sixth right cartilage; the mitral orifice lies to the left of the tricuspid valves, immediately behind the fourth costal cartilage; the pulmonary orifice is situated immediately behind the left border of the sternum, at the junction of the third costal cartilage with that bone; the aortic orifice occupies the third interspace, and is about half-an-inch lower than and to the right of the pulmonary orifice behind the sternum.

These facts having been remembered, and to understand further what is meant by the term hypertrophy of the heart, it is necessary, moreover, to have some definite idea of the size of the organ in health, and also of the relative thickness of the walls of its different chambers. The size of the heart, all authorities seem to agree, is, in health, about the same dimensions as the closed fist, and it weighs 8 to 10 ounces. The left side of the heart has to do more active work than the right, and nature has accordingly provided it with increased thickness of the muscular tissue to accomplish this. The relative thickness is as follows:—The right side is to the left as two to five; or, in other words, and generally, the thickness of the left ventricular wall more than doubles that of the right.

Hypertrophy of the heart is therefore most frequently found in the left side of the organ, or that side of the pump which has the most work to do.

This hypertrophy may be of two kinds. In the *first* there is simple enlargement of the muscular walls without dilatation of the corresponding chamber.

In the *second*, not merely are the walls thickened, but *the chamber is also increased in size*. The first is termed

“simple” or “passive,” the latter “active” or “eccentric.” The first is rare, the second frequent. Dilatation and hypertrophy thus most frequently go together, and the reason for this is obvious if we look at what is the

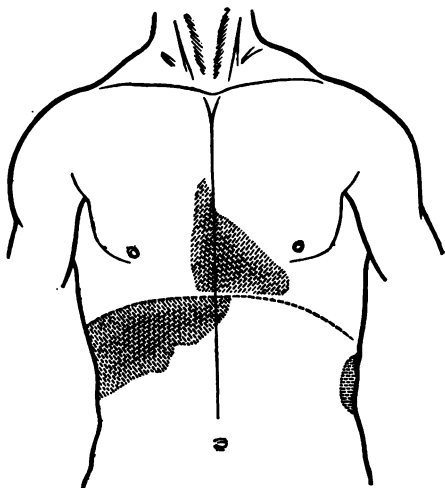


Fig. 7.—AREAS OF CARDIAC, HEPATIC, AND SPLENIC DULNESS.

cause of hypertrophy. In nineteen cases out of twenty there is some obstacle to the transit of blood to or from the organ. This obstacle may be in the heart itself, or may be due to its being pushed from its accustomed seat by disease of other organs,—such as pleurisy. The former cause is the more common. Thus, if the aortic valves, which act as sentinels to guard and guide the blood from the ventricles, become incompetent, allowing the blood to flow back again, or obstructed, not permitting it to get properly out of the chamber, hypertrophy *must* result. The heart has to put on increased force to

overcome the obstacle, and has to acquire increased space to contain the greater quantity now in the chamber. If the mitral valve is diseased, there will be an increased quantity of blood within the left auricle, and hence the chamber must be larger. The auricular action is not, however, strong, like the ventricular, and, as there is not so much increase of power needed, auricular dilatation often exists without hypertrophy.

On the right side of the heart we find increased size and thickness of the right ventricle, where there is some obstacle or too great patency in the pulmonary or tricuspid valves, or some hindrance in the diseased state of the lungs to the proper circulation of the blood, as from emphysema.

Symptoms.—In general the symptoms are developed slowly. They may be broadly enumerated as follows:—palpitation, dyspnoea, pain localised about the heart, and inability for active exertion, such as walking, running, or going upstairs quickly. Symptoms of granular kidney disease, more particularly alluded to at page 227, will also often be observed. The character of the pulse is usually strong, powerful, jerking; but it varies with varying causes.

On percussion, the area of cardiac dulness is found to be increased. The direction of the increased dulness varies according to the part of the heart affected. If it be the left ventricle, the extension will be downwards and to the left, giving an elongated shape; while, if the right ventricle be hypertrophied, it comes to form the apex, and thus the outline is square, and the dulness extended to the right. There is a sensible and very distinct heaving impulse communicated to the hand or the stethoscope. The heart-sounds are heard over a largely increased surface, and the apex-beat is removed from its place to a lower position, and more to the left than normal. Further, if the hypertrophy be simple, the first sound is obscure and muffled at the apex. If there is *hypertrophy and dilatation*, the first sound is loud, full,

and pronounced ; while, should there be valvular disease, murmurs will be heard, varying as to site and peculiarities with the valve implicated. If we remember that hypertrophy and dilatation generally co-exist, a practical summary of the two conditions may be expressed thus :—If the hypertrophy is greater than the dilatation, the dulness of the heart is chiefly increased from above downwards ; but when the dilatation is in excess, the dulness is greater transversely.

Treatment must be guided by the state of the patient. If of full and plethoric habit, rich food should be avoided, also all alcoholic stimulants, and tea and coffee. If, on the other hand, of weak and feeble frame, nourishing diet and tonic medicines are necessary. To combat the violent impulse of the heart, digitalis is useful ; while for dyspnoea, sp. chloroformi or other stimulants must be administered (F. 12).

ATROPHY OF THE HEART.—In contradistinction to hypertrophy or enlargement of the heart, with increase of the muscular substance, we sometimes find the heart atrophied or diminished in weight. The muscular substance becomes pale, soft, and flabby, and easily broken down. The weight of the organ may thus be reduced to one half of what it ought to be, and its chambers are small.

The simple form of atrophy is the result of debilitating disease, such as fever, cancer, marasmus, phthisis ; or it may be congenital, or the result of disease of the vessels which nourish the heart's substance—the coronary arteries. It is thus rather a post-mortem appearance than a distinct disease.

Symptoms.—If there is marked diminution of the size of the heart, the area of cardiac dulness will be decreased. The smaller quantity of blood contained in the cavities, and the feebler contracting power of the organ, will render the impulse weak and the heart's sounds indistinct. The pulse will also be found to be small. There are, however, *no certain diagnostic signs.*

FATTY DEGENERATION OF THE HEART.—There is another form of atrophy in which the muscular texture becomes altered by fatty degeneration. The term fatty degeneration does not imply that the heart is overloaded with fat, and has on its outside, or even dipping in between its muscular fibres, an increase of adipose tissue. This is rather and better termed a fatty growth—a something superadded. What is meant by the term “fatty degeneration of the heart” in reality is, that the healthy transverse striæ and nuclei of the muscular substance are obscured by groups of fat granules. The muscular fibres are soft, easily broken, and some authorities (Dr. Quain) have pointed out that there is frequently ossification of the coronary arteries.

Symptoms.—The diagnosis is beset with difficulties, the principal symptoms being a feeble action of the heart—pulse 45 to 50—weakness, giddiness, and sometimes faintness. Then there is what was once considered diagnostic of this disease, well-marked “arcus senilis,” due to fatty degeneration of the edges of the cornea. Yet it must be remembered we may have fatty degeneration of the heart without the arcus senilis, and *vice versâ*. Men are more often attacked than women. It comes on at all ages, but most frequently in advanced life. The prognosis is unfavourable.

It will thus be observed that fatty degeneration differs from a fatty growth of the heart; the latter being usually associated with general obesity, the fat which is normally deposited on the heart being abnormally increased, especially on the surface of the right ventricle.

Treatment can only be symptomatic.

PERICARDITIS.

The serous covering of the heart is liable to inflammation as the result of cold, of renal disease, of specific fevers, of wounds by fractured ribs, of the extension of *inflammation from lungs or pleura*; but, in the great

majority of cases, pericarditis occurs during an attack of rheumatic fever. The female is less subject to it than the male, in the proportion of one to five.

The result of this inflammation is the exudation of lymph or serum; and in the early stage of the affection, supposing we were enabled to open the body, we would find, most likely, the membranous sac partly filled with some serum, and with a plastic coagulable lymph. At a later stage the effusion would be found completely to separate the membranes with layers of lymph deposited, forming false membranes; while, at a still later stage, the effusion may have been absorbed, and the two sides become glued together (adherent pericardium).

The deposited lymph we have mentioned, on account of the continual movement of the heart, is laid down in a somewhat unequal manner, or in layers, just as the tide leaves the sand ribbed; or in some instances it is shaggy, like the rough surface of tripe.

Symptoms.—On auscultating at an early stage of the disease, before effusion has occurred, a to-and-fro friction sound is detected, from the serous membranes not gliding upon each other with the ease and smoothness of health. Essentially the sound is of a rubbing character, and has been compared to the unfolding of a crisp bank note, to the rustling of silk, or the creaking of new boots. The sound heard is essentially that of friction—light rubbing, scratching, grating,—and the impression borne to the ear is distinct from the generally soft blowing character of an endocardial murmur. It is also distinctly superficial, seeming to proceed, as it were, from a point immediately beneath the chest wall, and further, its occurrence is irregular in the cardiac cycle, following at one time the systole, at another the diastole—most commonly, also, both of the heart sounds remain audible, the friction murmur being interposed between them. It is not, moreover, propagated to such a distance as endocardial murmurs. These distinctive diagnostic points having been noted, it will be understood, in accordance with what has

been observed as to the nature of the effusion, that the friction murmurs are like those of pleurisy, most intense at the beginning of pericarditis, when the amount of exudation is small and the two layers of pericardium are permitted to come closer together, and towards its termination when the fluid portion of the exudation is absorbed, and only the firm fibrinous part is left behind. At the time when the exudation is most abundant the murmur may disappear, the serous surfaces being held apart by the mass of fluid interposed between them. In this latter case the endocardium is also very often involved, especially the mitral valve, so that there is usually a systolic bellows sound masking any friction sound which might otherwise be detected, and the murmur is permanent, unlike the friction sound, which does not, as we may recapitulate, last long; for the patient may die during its continuance, or the effusion may be so great as to prevent the membranes rubbing on each other, or they become adherent—glued together. When effusion has occurred, the dilated pericardial sac assumes a pyramidal form, with its apex upwards towards the second left costal cartilage, its base corresponding with the lower edge of the sixth rib; consequently dulness will be detected on percussion over this area, and varying to some extent with the position of the patient. If the pericardium becomes adherent, the dulness will be that of the normal heart. Can you tell if the pericardial adhesions have taken place? We have no certain signs, but we suspect this to be the case if dulness is unaltered by position or deep inspiration; if, similarly testing, the apex beat remains the same, and if one or more intercostal spaces or the epigastrium seem drawn in along with each pulsation of the heart.

The general symptoms attendant on pericarditis vary, and are sometimes so insidious as to attract little attention. This fact is often noted when pericarditis supervenes in the course of acute rheumatism. Pain, when the disease occurs from other causes, is referred to the

cardiac region, and is increased by cough or pressure, or lying on the left side. The heart's action is irregular and intermittent, and this is more apparent after the fatigue of speaking, or taking food, or any emotion. The patient lies propped up—complaining of headache, with anxious countenance and difficulty of breathing, and of disturbed and restless sleep. This restlessness passes into delirium in fatal cases, and is attended also with cedema of the lungs and other symptoms of malaëration of the blood.

Prognosis.—Pericarditis is a grave malady; yet, when occurring in rheumatic fever, it is not so much to be dreaded for its immediate as its after consequences, in producing endocarditis and leaving permanent valvular disease. Should it supervene in the course of a chronic disease, it is generally fatal, the prognosis being specially grave in Bright's disease and in cases of copious and rapid effusion. The prognosis should be determined rather by the complication than the disease itself.

Treatment.—General blood-letting, once so prevalent, has now been abandoned. The local application of leeches does good by easing the pain in the early stage of the disease, and should be followed by the application of hot linseed-meal poultices and fomentations. When effusion has occurred, the object is to promote absorption, and for this purpose blisters are serviceable. Mercury pushed to salivation is now rarely employed; combined with squills and digitalis it is a diuretic and absorbent, and as such may be given (F. 36). Iodide of potassium is also largely used (F. 5). The strength should be supported by strong soup, beef-tea, with wine and brandy, if these do not excite the action of the heart. Stimulation is specially necessary in pericarditis occurring in Bright's disease or fever.

ENDOCARDITIS.

By endocarditis is meant an inflammation attacking the lining membrane of the heart. It is usually associated, as has been indicated, with pericarditis; yet by some

authors it is contended that it exists as an independent disease. In any case, we do not often see this endocardial inflammation in its early stage. If we did, we would observe—

1st, Increased redness and vascularity.

2d, The membrane thickened and dull.

3d, Vegetations forming and attaching themselves to the valves, which are also involved in the inflammation. The valves may thus become thickened or puckered, or adherent to each other, and their healthy action is permanently impaired.

Symptoms.—Endocarditis, occurring as it does in the great majority of cases during an attack of acute articular rheumatism, Bright's disease, or pyæmia, has its symptoms so much masked by the severity of these affections that its actual existence is only recognised in many cases by the physical signs which it leaves of valvular mischief. There may be, however, an indication of its existence at the moment—general uneasiness about the heart, palpitation, restlessness, cold sweats, and increased fever. In a variety of endocarditis an ulcerative destruction of the heart's substance occurs, and this form is characterised by typhoid symptoms, prostration, and a rapidly fatal issue.

Treatment is the same as for pericarditis.

CARDIAC MURMURS.

On listening over the cardiac region in health, two distinct sounds are heard following each other at regular intervals. These sounds have been termed first and second, systolic and diastolic, as the one corresponds to the contraction (systole), the other to the filling up (diastole) of the ventricles. The first sound has its maximum intensity at the apex of the heart; the second at the base, or, more accurately, on a level with the third rib and a little above and to the right of the left nipple, near the left edge of the sternum. In determining,

therefore, the state of the heart, it is necessary first to apply the stethoscope at the apex and next at the base on the spots mentioned, and to ascertain whether or not a murmur or murmurs exist, denoting a variation from the sounds of health, and if so, what valve or valves are implicated. If of exocardial origin, as has been explained under Pericarditis (page 142), the sound heard is rubbing or grating. It is essentially superficial. It follows perma-

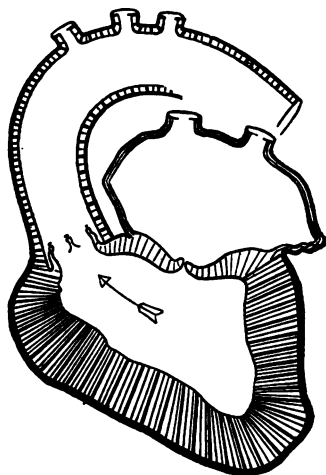


Fig. 8.—VENTRICULAR SYSTOLE.

nently neither the systole nor the diastole. It is irregular in point of time in the cardiac cycle. In order to realise what is to follow, it is advisable to leave out of account the right side of the heart, and to fix the attention entirely on the left side, and more particularly the left ventricle, which has two valves in connection with it—the mitral and the aortic. With the contraction or *systole* of the ventricle (Fig. 8), the mitral valve is *closed*, to prevent blood flowing back into the auricle,

and the aortic valves are laid back to allow it to go freely away on its circuit. With the filling up or diastole of the ventricle, the reverse of this happens (Fig. 9); the mitral valve opens and the aortic valves are closed to prevent the blood flowing back from the aorta into the ventricle. If disease has involved one or more of these valves, interfering with their healthy action, a murmur

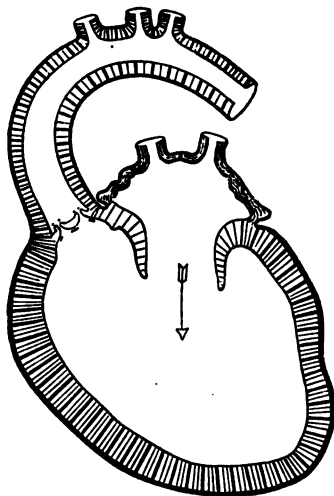


Fig. 9.—VENTRICULAR DIASTOLE.

or murmurs are occasioned, which may be considered regurgitant or obstructive according to rhythm or the time when they are heard; and thus we may have one or more of four great classes of murmurs, viz. mitral regurgitation, mitral obstruction, aortic regurgitation, aortic obstruction. The further great practical fact may be dogmatised thus:—Mitral murmurs are heard loudest at the apex, aortic murmurs at the base; accordingly, if a murmur is heard following the first sound, it may be

termed generally a ventricular systolic (V. S.) murmur. If loudest at the apex and diminished or lost at the base, it is due to mitral regurgitation; or if loudest at base, it is dependent on aortic obstruction. If a murmur follows the second sound, it may be termed generally a ventricular diastolic (V. D.) murmur, and as indicating its nature, aortic regurgitant. Again, a murmur may be heard following directly neither the first nor second sound, but immediately preceding the first; it may be termed auricular systolic (A. S.) murmur, or *præsystolic*, or, as more definitely recognising its causation, mitral obstruction.

Attention to these considerations will enable the student generally to detect the nature of the lesion, aided as he will be by the state of the pulse, which as a rule is soft and compressible in mitral, and hard and jerking in aortic disease; and by the pulmonary symptoms, which are more common and urgent in mitral, while cerebral symptoms or complications are more often associated with aortic disease. I purposely say nothing of diseases of the right side of the heart, as they are rare; and to enter completely into their causation would confuse the conception desired to be retained by the student of a single-chambered organ in connection with the subject of heart-murmurs.

The following tables, read, however, in connection with what has been said, can now be understood:—

A.—Mitral obstruction, stenosis, *præsystolic* murmur, indicates an impediment to the flow of blood from the left auricle to the left ventricle. Recognised by a purring thrill at apex; a murmur running up to the first sound and loudest at apex; a feeble, often irregular pulse; difficulty of breathing after exertion. It occasions sometimes little uneasiness; sometimes pulmonary congestion and spitting of blood; sometimes it terminates in sudden death.

B.—Mitral regurgitation, incompetence, an imperfect closure of mitral valve, permitting blood during contraction of ventricle to flow back to the auricle. Recognised by a blowing murmur following the first sound, and heard

loudest at the apex ; diminishing towards or inaudible at the base ; confirmed by its being heard at inferior angle of left scapula ; pulse feeble and irregular. Caused by contraction or roughening of segments of valves ; by dilatation of left ventricle ; by irregular contraction of papillary muscles. Resulting in more or less suffering



Fig. 10.—MITRAL REGURGITATION.

from congestion of lungs, liver, and kidneys ; rarely in sudden death.

C.—Aortic obstruction, stenosis, narrowing of orifice, preventing blood flowing easily from the left ventricle into the aorta. Recognised by a murmur following the first sound, heard loudest at the base, at second intercostal space of right side, always propagated to the vessels of the neck, and having its point of greatest intensity at the right border of the sternum in the second intercostal space, *sometimes with considerable intensity downwards along the sternum* ; pulse small, hard, and diminished in volume, in later stages soft and slow. Resulting often in little suffering for years, in consequence of compensating hypertrophy of left ventricle. But when compensation *begins to fail* there are frequent attacks of dyspnoea and

hæmoptysis, and fits of faintness and dizziness through anæmia of the brain, the patient having consciousness,

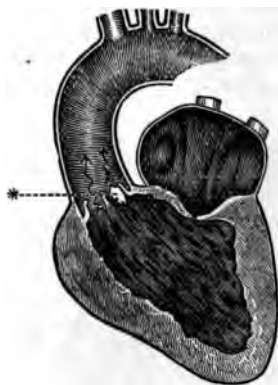


Fig. 11.—AORTIC OBSTRUCTION.

but no command of motor power. In contrasting it with “mitral stenosis” the comparison is far more favourable with regard to the duration of life.

D.—Aortic regurgitation, incompetence, an imperfect closure of the aortic valves, causing regurgitation.

Characterised by a murmur accompanying the second sound, whirring, rushing, diffused more or less along the whole sternum, although perhaps loudest at the third right costal cartilage. If the insufficiency is very great, a reduplicated murmur, both systolic and diastolic, may be heard by pressure with the stethoscope when auscultating over the crural artery; shotty jerking pulse—“*pouls de Corrigan*.” So long as the increased force of the left ventricle suffices to prevent any stagnation of the circulation, there may be years of undisturbed good health; but when once compensation becomes imperfect, the reaction on the venous system—induced by the stagnation and the *dropsy*—leads to a quick and fatal result, sometimes ending in sudden death. Sudden attacks of dyspnoea and

oppression, a spasmodic pain beneath the sternum, are often observed; fainting and dizziness, indicating dis-

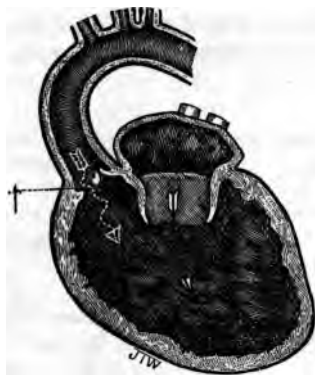


Fig. 12.—AORTIC REGURGITATION.

turbed cranial circulation, are most unfavourable symptoms.

E.—Tricuspid obstruction: rare.

F.—Tricuspid incompetence, regurgitation, imperfect closure of tricuspid valve. Recognised by increased dullness of right side of heart; diffused pulsation over the right ventricle; murmur with the first sound; pulsation and fulness of jugular veins; dyspnoea and dropsy; generally associated with mitral regurgitation or emphysema.

G.—Pulmonary stenosis: rare.

Pulmonary incompetence is also rare, and is detected by its situation over the pulmonary valves, by its loudness and non-propagation from this spot.

It must be remembered that these murmurs are frequently combined—the most frequent combination being aortic obstruction and regurgitation; mitral obstruction and regurgitation; various combinations of mitral regurgitant and aortic murmurs. These murmurs, which are termed *organic*, are permanent, and must be distinguished

from another class of murmurs, denominated "functional," "inorganic," "accidental," "anæmic" murmurs. These are generally associated with chlorosis and other chronic diseases leading to altered condition of the blood. They are also sometimes noticed in acute diseases, as pneumonia,

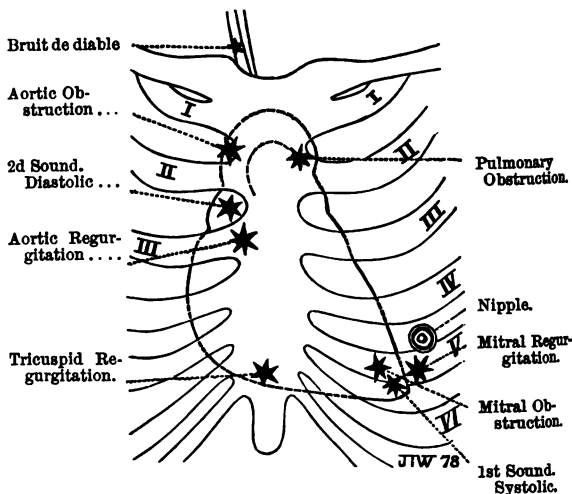


Fig. 13.—AUSCULTATION OF HEART SOUNDS. POINTS OF GREATEST INTENSITY OF DIFFERENT MURMURS.

typhus, scarlet fever, or small-pox. They are distinguished by the following considerations from the permanent or organic murmurs :—

1. They are soft, feeble, blowing ; never harsh or rasping.
2. They are always systolic, never diastolic.
3. They occur most frequently at the pulmonary orifice, next at the mitral orifice ; very seldom at the aortic or tricuspid valve.

4. They are, especially in chlorosis, combined with murmurs in the veins of the neck.
5. If the health improves they disappear.

Any præ systolic or diastolic sounds indicate organic changes. The diagram on preceding page indicates the points of greatest intensity of the chief murmurs mentioned.

Treatment.—The question of treatment in diseased valvular conditions of the heart depends chiefly on the nature of the lesion, the time of its discovery, and the giving or withholding of digitalis. A valvular organic murmur, single or combined, having been detected, all prophylactic treatment is valueless; and we possess no means of remedying what must be a permanent defect. *Post-mortem* appearances in heart disease indicate the compensatory efforts of nature to overcome or modify the various obstacles to, and deficiencies of, the proper flow of blood from the central organ. The indications of all well-directed treatment, therefore, are to follow the suggestions of nature, and assist the development of compensation when already in existence, to maintain it as long as possible, and to moderate over-compensation. Further, in affection of the aortic valves, clinical experience testifies that when the heart muscle is well nourished, and the bodily stamina maintained by a carefully regulated diet, avoidance of all unnecessary excitement, spirituous liquors, and smoking, perfect compensation may be maintained for years without any medicinal agent, and average good health may be enjoyed. When the mitral valves are implicated, the same average good health cannot be enjoyed, for there is always more or less pulmonary mischief revealed on exertion, or through fatigue or excitement, and nature cannot give compensation so complete as to obviate the phenomena of failing health. Hence, while the same precautions previously mentioned should be strictly, even more strictly enjoined, we should endeavour, on the first detection of mitral disease, whether

obstructive or regurgitant, to assist nature's compensatory efforts by means of digitalis. Without entering too minutely into the process, it will be found, when cautiously regulated in mitral obstruction, to increase the fulness and regularity of the pulse; to diminish the tendency to spitting of blood; to heighten arterial tension and counteract approaching dropsy. So also in mitral regurgitation, it dismisses the feeble irregular contractile efforts, and concentrates cardiac action in well-directed beats, and thus saves the over-distension of the right heart. In both cases it may be continued for a considerable time; but if the urine is found to diminish instead of increase somewhat in quantity, it is advisable at once to stop it, and resume it again as circumstances and prudence may suggest. The tincture is the most convenient form for continuous administration, in doses of 5 to 10 minims, with a similar quantity of tincture of perchloride of iron. In the form of infusion from the freshly made leaves, in teaspoonful doses thrice daily, its diuretic properties are more apparent, and it can be given in this way when these are chiefly desired.

While it is inadvisable to give digitalis in the earlier stages of aortic disease, it will be found in advanced cases, when dropsy has begun, when the dyspnoea is intense, when the compensatory effort has been taxed to its utmost limit—theoretical considerations notwithstanding,—that digitalis in infusion, with acetate of potash, or in pill with squills and mercury, exerts marked benefit. Probably this may partly be explained by the fact that in such long-standing cases all of the valves of the heart are more or less involved. For, granting that the aortic valves were primarily diseased, we often see in this "stage of disturbed compensation," with the pulse low, the action of the heart irregular, and the urine scanty, that the diuretic value of digitalis is inestimable. Foreign observers speak highly, then, of its combination with quinine, three grains of the sulphate being administered *thrice daily*, with from one to two grains of the powdered

leaf. To promote cardiac and renal activity where digitalis causes gastric disturbance, or, generally speaking, does not agree with the patient, the inhalation of compressed air, especially in mitral or aortic obstruction, has recently been strongly recommended. It is said that in such cases when Waldenburg's apparatus is used, the pulse rises, and diuresis is established.

To ease also the irritability attendant on all forms of cardiac disease, and too surely evidencing exhaustion of the organ against mechanical difficulties, the application of cold to the region of the heart is useful. For this purpose, a metal or gutta-percha vessel filled with water or ice, and having a concave surface to fit in against the ribs, may be fitly employed for two hours daily. To obviate the stagnation and slower circulation in the liver and abdomen seen in early stages, rhubarb with quassia and gentian may be prescribed, or, better still, if circumstances permit, a few weeks may be profitably spent in drinking the waters of Homburg or Kissingen, or bathing in the warm springs of Soden. Such means remove the complaint temporarily, and with renewed appetite there comes increased strength.

Generally speaking, we have indicated when digitalis is useful, and we may conclude the subject of treatment by it in heart disease by stating that there is a consensus of opinion as to its inadvisability under the following conditions :—1st, In fatty heart. 2d, If there is intermittency of the pulse ; or if intermittency or diminution of urine is brought on during its use. 3d, If it produces vomiting or giddiness. 4th, If there is marked atheroma of the vessels. Its non-employment in the early stages of aortic disease has been explained ; its use or not in the later stages must be left to the mature deliberation of the practitioner, and can scarcely be dogmatically decided upon.

PALPITATION OF THE HEART.

By this term we understand increased frequency of cardiac action, without any pathological changes which we can recognise as originating these; and as thus understood, it may be defined as an antagonism between different factors of innervation of the heart. The factors of innervation of the heart, so far as recent investigations show, are, according to Schroetter:—1st, The ganglia which are found imbedded in its substance, both in the auricles and the ventricles. 2d, Cardiac branches of the ganglion stellatum which pass down to the heart between the aorta and the pulmonary artery, and which take their origin from the cervical portion of the sympathetic. 3d, Nerve fibres, which originate in the medulla oblongata, run the length of the spinal cord, and pass out from the cord with the spinal nerves. They then become entwined with the sympathetic of the thorax and abdomen, whose branches in part extend from below upwards to the heart. Irritation of these increases the functional activity of the heart. 4th, Irritation of the sympathetic may act in another way by causing a change in the tone of the vessels, and an accompanying variation of the blood-pressure. Thus irritation of the sympathetic may cause contraction of the vessels, and increased blood-pressure in the aortic system. So the labour of the heart is augmented, while, on the other hand, paralysis of the sympathetic, with the accompanying dilatation of the vessels, will cause a diminished resistance in the vessels, and a consequent diminution in the labour of the heart. 5th, In opposition to these excitator nerves, we have the so-called restraining or inhibitory apparatus. This is made up of the pneumogastric and its ramifications. If we irritate the vagus, the movements of the heart are slackened in frequency, and finally come to a standstill in diastole; if we divide the vagi the heart begins to beat faster, for the power and influence of the restraining apparatus are destroyed.

Varying causes acting on the nervous supply of the heart may originate palpitation—mental excitement, joy, fear, anger, strong tea, alcohol, tobacco, indigestion, exertion, gout.

The symptoms which accompany palpitation without organic disease are variable. Chief among them, in addition to the increased beating of the organ, are dyspnoea, general distress, dizziness, a feeling of faintness, specks before the eyes, flushings or pallor of the face, ringing in the ears, and pain referred to the cardiac region. The causes being diagnosed and removed, the palpitation is removed. While the attack is severe the application of cold cloths to the chest may be employed, and a hypodermic injection of morphia. Preparations of hydrocyanic acid and chloral are also serviceable.

THORACIC ANEURISM.

Those dilatations which are termed aneurisms affect at one time the whole of the artery for a certain distance, and at others only a portion of its circumference, and they may be cylindrical, spindle-shaped, or sacculated. The size may vary from that of a pin to that of a man's head, and the walls are almost constantly formed by the diseased arterial coat. Frequently the three coats are distinctly recognisable, in others only one or two can be distinguished. The external coat usually survives longest, while the inner or middle coats are the first to give way. The cavity of an aneurism rarely contains only fluid blood; usually there is more or less of a fibrinous coagulum deposited in layers over the lining membrane, and sometimes by this coagulum becoming converted into fibrous tissue the sac may be filled up and obliterated.

In the great majority of cases the cause of the formation of an aneurism depends on an alteration of the middle coat of the artery—this alteration being the result of atrophy or fatty degeneration. To this general cause *many accidental causes* may concur in producing an

aneurism. Thus, in vessels already diseased, a fall, a blow, any violent exertion, may rupture a few fibres or laminae, and may suffice for the commencement of further dilatation.

Unless due directly to mechanical injury, aneurisms are of most frequent occurrence in middle and advanced life; before the twentieth year aneurisms of the large arteries are very rare. They are more frequent in men than in women, and a laborious occupation or violent athletic exercise tends to their development. The disease is comparatively rare, and its frequency varies in different countries. It is most common in England. In Germany it is less common than in France, and in Italy it is very rare.

Aneurisms are almost confined to the aortic arterial system, and are seldom observed in the pulmonary artery.

There are three chief situations for thoracic aneurisms; viz. the ascending portion of the aortic arch, the transverse part of the arch, or the roots of the large vessels arising from the arch. Most frequently they spring from the ascending arch, and from the convexity rather than the concavity.

Aneurisms of the arch embraced by pericardium are always small in size, and are usually associated or confounded with simple aortic valvular disease. When the aneurism is situated beyond the pericardium, it frequently attains a very large size, displacing the lung outwards, especially on the right side, and anteriorly coming in contact with the anterior thoracic wall, where it may ultimately form a visible pulsating tumour. In the interior of the chest it presses on the right lung, and may compress the descending vena cava, and involve the right pneumogastric nerve. An aneurism in this situation is liable to open externally or internally into the pericardium, right pleura, or lung itself; an aneurism of the transverse arch springing from its convex portion spreads upwards and to the left, pressing upon the manubrium sterni, the *clavicle*, and the left upper ribs, in the same situation.

A tumour is thus formed in the region mentioned, which sometimes rises from the sternum into the root of the neck. If it springs from the posterior surface of the transverse portion of the arch, its course is often latent.

Aneurisms of the descending part of the arch are rarely to be detected until they have attained a large size, although their presence may be suspected by dulness, pulsation, murmur, absence of respiration over a limited area, with dull aching or burning pain over the vertebræ.

The exact anatomical relations of thoracic aneurisms of moderate size may thus be summarised :—

1. Aneurism of the ascending aorta (the most common variety) forms a pulsating tumour in the second right intercostal space near the sternum.

2. Aneurism of the transverse part of the aortic arch is situated at the level of the manubrium sterni, but reaches to a variable distance to the left of that bone, according to the size of the swelling.

3. Aneurism of the descending aorta renders prominent a part of the left posterior surface of the thorax in the neighbourhood of the lower dorsal vertebræ.

General Symptoms.—When the tumour can be detected externally, the diagnosis is easy, but if this is not the case the symptoms are obscure, and generally speaking consist in cough, dyspnoea, difficulty in swallowing, and pain about the chest and back. The pain is generally dull and heavy. Occasionally it occurs in paroxysms, and is boring and pulsating, and may be increased by mental emotion. With the pain there is often a feeling of tightness of the chest simulating that of angina pectoris. The cough is audibly brassy in character, and attended with a suffocative feeling if one or both recurrent laryngeal nerves are implicated; and if the tumour extends deeply backwards, pressing on the ganglia and branches of the sympathetic, there will be permanent contraction of the pupil of the affected side.

The physical signs are dulness, “bruit,” absence of respiration, or bronchial respiration from pressure on a

bronchus. Again, if the transverse part of the arch be the seat, the tumour or pulsation may be felt by placing the finger deeply in the supra-sternal notch. Heart murmurs and pain, or numbness of the arm or side, serve to confirm our diagnosis.

The duration of the disease is uncertain. In thirty cases collected by Lebert the disease lasted from one year to four years. The disease seems to make more rapid progress in young people than in old. The prognosis is necessarily very unfavourable.

For treatment, see page 161.

ABDOMINAL ANEURISM.

Aneurisms of the abdominal aorta are more frequent above than below the coeliac axis. They are spindle-shaped or saccular (from three to six inches in mean diameter), often of very considerable size, the contents sometimes weighing as much as ten pounds. They project from the anterior surface or sides of the artery, and tend to develop downwards and to the left more than upwards and to the right because of the liver and the diaphragm.

Symptoms.—A tumour is usually found to the left, just above the navel. On palpation a forcible pulsation is perceived, a little after the apex beat, and accompanied with a thrill, and along with this thrill a murmur is heard. The murmur may be propagated into the iliac and femoral arteries. If the aneurism is situated high up it cannot be palpated, and we can only perceive the pulsation communicated through contiguous parts (liver, spine, etc.) and hear the murmur similarly propagated.

Functional disturbances may also be present in a greater or less degree. The most common of these is pain in the belly and in the back, corresponding to the seat of the tumour. There may also be vomiting, diarrhoea, or constipation.

The general condition of the patient may remain unaltered for some time, or there may be progressive debility

Rupture of the aneurism is frequent, giving rise to sudden peritonitis ; or sometimes an aneurism of this kind may burst into the left pleural cavity.

Treatment.—The general treatment must be that advisable in all forms of cardiac disease, viz. rest, and avoidance of all excitement, mental or bodily. Probably Tufnell's method in thoracic as in abdominal aneurism is the best ; the principle being the giving of a spare, dry diet, with few liquids, and the enjoining of strict and absolute rest in the recumbent position. Hence he orders six ounces of milk, two ounces of roast meat, and six ounces of bread and butter daily. By this means the blood tends to coagulate in the sac ; just as water, through which a comparatively stagnant stream flows, affords every opportunity for the accumulation of débris on the sides, so in this way, at the sides of the aneurismal sac fibrin becomes accumulated in layers, and ultimately is moulded into the walls of the sac.

Of medicinal agents, iodide of potassium, in large and increasing doses to the extent of 90 grains daily, is held most in repute. This drug has the support of eminent English and foreign authorities. By Bonjean's process a purified aqueous extract of ergot (ergotine) is obtained perfectly soluble in water. A solution is made, 12 grs. to a drachm of water, and of this 10 minims may be injected in the immediate neighbourhood of the tumour, at intervals varying from half a day to several days. The object of this is to diminish the sac by producing contraction of its muscular elements, and the tumour is said to become gradually small and hard, and the pulsation to disappear.

Galvano-puncture in some cases has been successful, the object being to produce local coagulation of the blood in the sac. Under favourable circumstances one single electro-puncture may be sufficient ; in others it may require to be repeated after a lapse of some weeks. It is essential that the closing and opening of the current should be made gradually to avoid shocks, and that the *needles should be introduced so that they shall not come*

in contact with each other. If these rules are observed no evil results need be anticipated. Out of twenty-three cases related by Ciniselli, five were cured ; and he states "that the mechanical action of the needles is combined with a chemical action produced by the electrolytic decomposition of water and of the salts of the blood."

DISEASES OF THE DIGESTIVE SYSTEM.

In all diseases, as a matter of routine, the tongue is necessarily examined. Thus it may be moist or dry, its size and colour may vary, and it may be abnormally clean or covered with epithelium or "coating." Valuable indications may thus be afforded as to the disease itself, or the state of the system generally towards recovery or the reverse. It is impossible, however, by its appearance to predicate what the disease may be, though it is useful to remember that the tongue is pale in general anæmia ; red as to its tip, edges, or papillæ, in subacute inflammatory stomach derangement. If covered with a thick fur, the stomach also is similarly affected in its mucous membrane, whereas, if it looks raw, as in scarlet fever, the other parts of the gastro-intestinal tract are also involved.

The tongue may be the seat also of local affections. Thus, simple ulcers, the result of gastric derangement, may form on the tip or frænum of the tongue. Ulcers may be of syphilitic origin, and if so, are usually situated at the sides of the tongue and inside of the lips. Sometimes syphilis forms oval bald patches, without any ulceration.

Treatment.—If the result of gastric derangement, attention to the diet and a mild purgative will generally effect a cure (F. 8). If of syphilitic origin, then the constitutional remedies for that disease must be put in force.

STOMATITIS.

Inflammation of the mouth or stomach may occur under several forms. Thus there is a variety called simple or catarrhal, commencing with bright red patches on the inside of the cheeks, and extending with considerable swelling until the whole surface may be covered, and attended with a bad taste, furred tongue, and want of appetite. The mucous follicles, again, may be enlarged and obstructed, and when they soften and burst, as they usually do, small ulcers are left with some redness. This variety is termed "follicular." In infants, especially after some feverishness and restlessness, small yellowish-white spots on the lips, cheeks, or palate are seen. These are vesicles, which, bursting, leave small ulcerations. This form is called "aphthous." Two other varieties claim a few additional words.

PARASITIC STOMATITIS depends on the presence of a parasite, *Oidium albicans*. There is heat and pain in the mouth, and the disease is revealed by whitish-gray patches, looking like curdled milk and easily detached. It is peculiar to young infants, being known by nurses and mothers as the "Thrush." Sometimes it appears in the course of phthisis in adults, and is a specially unfavourable symptom.

GANGRENOUS STOMATITIS, or CANCRUM ORIS, is a rare but dangerous affection, attacking weakly children recovering from measles or other acute diseases. The ulceration commences on the mucous membrane of the lip or cheek, and spreads to the deeper tissues, perforating the skin and destroying the jaw, and leaving a hideous excavation with ragged gangrenous edges. It is noteworthy that pain and tenderness may be slight or altogether absent.

Swelling of the cheek, intense foetor of the breath, great salivation, and rapid prostration, with a fatal termination, accompany the local changes described.

Treatment.—In all affections of the mouth, chlorate of potass seems beneficial, given in five-grain doses to an infant of a year old, but increased to twenty or thirty in an adult (F. 7). Borax and honey may be applied locally in thrush; and in cancrum oris the only chance for the child depends on its being put under chloroform, and having the part burnt with strong nitric acid. The strength must also be supported by brandy and beef-tea, and the mouth should be freely washed with Condy's fluid or carbolic acid solution.

MUMPS, CYNANCHE PAROTIDEA, is an acute contagious affection of the parotid and other salivary glands; the parotid especially being much swollen, and painful to the touch. It is attended with some fever, and difficulty of opening the mouth and swallowing. The disease extends over a period of four or five days, and terminates in recovery, its declension being occasionally marked by swelling of the testicles or mammæ.

QUINSY, CYNANCHE TONSILLARIS, is attended with fever, fetid breath, and pain in one or both tonsils, shooting along the Eustachian tube into the ear.

The tonsil or tonsils are red and inflamed, the inflammation terminating in resolution or progressing to suppuration, with speedy recovery following the discharge of pus.

It is caused chiefly by exposure to cold, and is most common in youth.

A form of chronic tonsillitis is not uncommonly seen in young and delicate children, where the tonsils are enlarged and the voice husky, with occasional deafness.

Treatment.—In mumps a saline mixture and a flannel bandage over the glands are alone requisite (F. 66). In quinsy the inhalation of steam and the application of hot linseed-meal poultices hasten resolution or promote suppuration. Sulphate of magnesia (F. 24) can be recommended. Guaiacum is by some considered a specific (F. 6). In chronic tonsillitis excision of part of the gland is sometimes necessary.

DISEASES OF THE ŒSOPHAGUS.

Acute inflammation may attack the œsophagus, constituting what is termed "acute œsophagitis," and may be due to extension of simple catarrhal inflammation of other parts; to direct injury from foreign bodies, or swallowing some corrosive poison; or it may be a complication of specific fevers, or cholera, or pyæmia. It is attended with pain, more or less severe, deep in the chest in the course of the œsophagus, with painful difficulty of swallowing and the vomiting of what has been taken, probably mixed with blood or membranous casts. There is also much thirst and great general distress.

The œsophagus may be the seat of stricture, either spasmodic or real, or of cancer.

The affections are all characterised by one prominent symptom—difficulty of swallowing, with, in cancer, also great pain, enlargement of the lymphatic glands, cough, and husky voice, through pressure on the trachea or recurrent laryngeal nerves. Non-cancerous stricture is generally the result of swallowing some corrosive poison.

In attempting a diagnosis when the symptoms point to the œsophagus, it is important to look to the age and sex of the patient, to the presence or not of a cancerous cachexia, to the implication of other organs, and to the knowledge as to the seat of stricture, if there is any, conveyed by an examination by the bougie. In forming a prognosis it is to be remembered that spasmodic affections of the œsophagus, though difficult to get rid of, are not fatal; whereas every form of obstruction is unfavourable, and in cancer a fatal termination may be foretold.

Treatment can only be palliative, unless in the spasmodic stricture of young and hysterical females, when the general treatment recommended in hysteria may be adopted. In spasm, friction with a belladonna liniment, *the passage of a bougie*, and careful dieting are essential.

DYSPEPSIA.

The stomach is the natural receptacle of the food we eat and the liquid we drink. It starts on equal terms with other organs, but its powers of endurance are more than those of any other organ. Into it are thrown the most heterogeneous compounds, and it is expected to do its duty satisfactorily, whether we lead the life of an anchorite or an epicure; or if we go to neither of these extremes, if we neither eat too plainly nor too abundantly we may yet try its staying powers by the rapidity with which we swallow our food, or the length of time allowed to elapse between meals.

An organ tried so much naturally rebels, gets out of gear, and sooner or later dyspepsia or indigestion supervenes, and the whole body sympathises with its ailments. The mind becomes clouded, and the temper peevish, bodily vigour is impaired, and life is rendered not a pleasant holiday, but a sour and angry fact. Dyspepsia has many symptoms, and a brief consideration will be given to the most prominent of these, and how they may be met.

Want of Appetite may depend on mental causes, as joy, or anger, or anxiety, or it may appear without any apparent cause. Common sense must dictate how to deal with the former causes, and for the latter, an acid or a bitter infusion may be employed (F. 10).

Nausea and Vomiting.—Nausea after taking food, which may or may not terminate in vomiting, sometimes attracts attention—the vomited matters being sour at first, and if long continued mixed with bile. To soothe this irritability there are special therapeutic remedies, in addition to careful regulation of the quantity and quality of food, such as creasote and hydrocyanic acid (F. 9).

Flatulence and Belching.—Flatulence, popularly termed “the wind on the stomach,” may be due to many causes, prominent among which are food ferment-

ing, or the want of an accustomed meal at a certain hour.

It is often relieved by warm carminatives (F. 13), and by the injunction of a regulated interval between meals. If it immediately follows the taking of food, pepsine is useful, or rhubarb (F. 91).

Should belching be accompanied by a rotten-egg flavour, showing the evolution of sulphuretted hydrogen gas, charcoal biscuits should be ordered and creasote ; if there is also great acidity, sal-volatile and carbonate of potass (F. 73).

Pain.—Cullen described two kinds, cardialgia or heartburn, and gastrodynia or cramp, or spasm of the stomach. For simple heartburn black sugar is efficacious, or eating an apple, or a draught of liquor bismuthi and spirit of chloroform, or (F. 11). Gastrodynia Dr. Abercrombie thought was due to a loaded colon, and hence ordered a brisk purgative, followed by carminatives (F. 25, 13). A mustard poultice often gives relief.

Water Brash, Pyrosis, attended with the eructation of thin tasteless watery fluid, may be connected with organic disease of the stomach, or with the taking of some particular kind of food, as oatmeal. Treating it simply as a symptom, pulv. kino, co. can be recommended, combined with a watery purgative in the morning, as Friedrichshall or Pullna.

In 1842 John Goodsir discovered in the vomited matters of certain patients small flat bodies having a rectangular outline, and a somewhat oblong shape, and resembling little packets tied lengthwise and across with a string ; hence he called them *sarcinæ* (bundles). They are dependent on fungi, and are symptomatic of organic disease by which the stomach is prevented from completely emptying itself. Sulphite of soda given in 20 to 60 grain doses relieves what probably is an always incurable disorder, by the sulphurous acid being set free in the stomach.

Dyspeptics constantly ask, What shall we eat, and

what shall we drink? and, although no fixed rules can be laid down, the following points are of practical importance.

Mutton is probably the most digestible of all animal food, while all cured meats—ham, tongue, sausage—are indigestible. Animal food is more easily digested than vegetable. While man's organs of digestion ally him more to the carnivorous than the granivorous race, yet a mixture of animal and vegetable food suits the stomach best. Do not press prohibitions as to food too far, else you will convert the dyspeptic into a confirmed hypochondriac.

Interrogate the patient as to his own sensations with regard to liquids, as no definite rule can be given. Beer agrees with some, sherry or claret with others. Many men can be total abstainers with impunity, many others cannot, and require whisky or brandy with meals. The consideration of the idiosyncrasies of each individual case must thus be duly weighed in regulating the dietary of the dyspeptic.

GASTRIC ULCER.

Ulceration of the stomach is by no means an uncommon affection, and its existence was known to the ancient physicians, who laid down distinct rules for treatment. In recent years zealous inquiries have been made as to the causation of the disease, the pathological anatomy of which is so peculiar.

Pathology.—It is a specific variety of ulcer. It is a distinct local lesion, and has only one analogue, viz. the corroding ulcer of the neck of the uterus. The *form* of the ulcer is that of a funnel. It seems punched out, and the edges may be bevelled off or thickened. The *shape* is usually circular. The size varies from that of a pin's head to one-third of the mucous membrane of the stomach. It may be of all degrees from partial removal of the mucous membrane to perforation, and it may be, as observed on

post-mortem examination, either open or else partially or completely cicatrised—the relative frequency of the two conditions being about equal. Its site is markedly more frequent on the posterior than on the anterior wall of the stomach, its exact location being in four-fifths of the cases upon a surface bounded by the posterior wall, the lesser curvature and the pyloric region. The rest of the surface of the stomach, while it is much larger, appears only to be affected in one-fifth of the cases. If situated on the anterior wall perforation more readily occurs, on account of there being no place for limiting adhesions, while if on the posterior, adhesions may take place to the pancreas, etc.; and thus, although the stomach is actually perforated, the adhesions prevent its contents passing into the peritoneum. It is worthy of note that by means of adhesions a communication may be set up between the stomach and colon, and thus faecal matters may be vomited with ease, not with difficulty, as in ordinary stercoraceous vomiting. The nearer the ulcer is to the coronary vessels, the greater the tendency to fatal hæmorrhage.

Etiology.—This ulcer, found only in the stomach or immediate neighbourhood, and unattended by suppuration, and characterised by simple progressive molecular death, has suggested the explanation of its being caused by a corrosive action of the gastric juice, which could only occur under two conditions—(1) this gastric juice being either abnormally acid, or (2) the alkalescence of the wall of the stomach being abnormally diminished. These assumptions have been confirmed by the experiments of Pavy, who has found, if a certain quantity of acid is introduced into the stomach, and the circulation is left undisturbed, the stomach remains unaffected; but if with the same amount of acid the circulation is interrupted, the stomach becomes digested. If, moreover, the quantity of acid is greatly increased without interruption of the current of blood, digestion will likewise take place.

The derangement of the circulation, so essential to the

production of the ulcer, may be due to a variety of causes, all of which, according to Virchow, "act by interrupting the circulation in circumscribed portions of the wall of the stomach." Among these causes may be mentioned thromboses or emboli in diseased gastric arteries, and chronic hyperæmia of the mucous membrane.

Symptoms.—Painful intolerance of food is the chief symptom. The pain which is felt at the epigastrium varies in intensity, and appears within a quarter of an hour after food is taken, being increased by emotions or pressure over the umbilical or dorsal regions, according to the situation of the ulcer. Vomiting of food in all stages of digestion, with or without blood, is a pretty constant symptom. The quantity of blood varies greatly, but when present in any quantity it is a most important sign. Constipation almost invariably accompanies gastric ulcer, and the patient has a worn-out, low-spirited aspect. Lastly, the failure of all remedies and the chronic history help us in forming our diagnosis.

The intensity of the symptoms varies more according to the position than size of the ulcer, on account of some positions being more exposed to constant friction than others. If the ulcer be close to the pylorus, we may have stricture from spasm of the pyloric muscle, and thus the vomited matter will be in a sour and fermented state from its long retention in the stomach. Again, if the ulceration goes on to perforation, and no limiting adhesions form, the contents pass out of the stomach, and give rise to symptoms of acute general peritonitis.

The course of the disease is very chronic, lasting sometimes the greater part of a lifetime. It may occur at any age, tending more to cicatrisation in the old and perforation in the young.

This chronic course runs on to one of three terminations.

1. After long suffering, sometimes with relapses, the *patient gets better*, owing to the ulcer cicatrising, still,

great care must be observed. This occurs in half of the cases.

2. Sudden death, from shock, owing to its bursting into the peritoneum; from peritonitis, or from hæmorrhage.

3. Gradual death, from sheer wearing out. In such cases amenorrhœa or phthisis may supervene. :

Treatment.—We have neither prophylactics nor specifics. All food should be given in very minute quantities and in liquid form. Hence milk, solution of beef, or soups containing white of egg, are most useful. In order to get the stomach to retain sufficient food, opium should be given by the mouth, so as to act as a gastric sedative during digestion. Collections of acid matter in the stomach may be prevented by alkalies or alkaline saline mineral waters. If vomiting continues, we must have recourse to bismuth, dilute hydrocyanic acid, creasote, or ice, and if all these fail, make use in time of nutrient enemata (F. 9). In six typical cases of gastric ulcer lately under my care, beef-tea enemata were alone trusted to for nine days, only iced champagne being given occasionally by the mouth. At the expiry of the time mentioned there was a cautious return (1st) to liquid, and (2d) at the end of a week to easily-digested solid food. The results were very satisfactory. When there is hæmatemesis, if not severe, ice, gallic acid (F. 19), or turpentine, may be tried; but if much blood is being vomited, we should try at once the subcutaneous injection of ergotin.

CANCER OF STOMACH.

Cancer has a partiality for the orifices of the stomach, being most common at the pylorus. When in that situation it is usually fungating or villous, of the scirrhus type, and may be associated with cancer elsewhere—especially of the liver. When at the cardiac orifice, the cancer is always of the epithelial type, and frequently *extends up the œsophagus*. The body of the stomach is

very rarely affected without the orifices. Under the age of thirty cancer of the stomach is rare. The average of 600 cases was, according to Brunton, fifty years. Sex appears to have no influence in its production.

Symptoms.—Vomiting and pain are pretty constant symptoms. When the pylorus is involved the vomited matter is frothy and fermented, containing sarcinæ, and the pain comes some time after taking food. If the cardiac orifice be the seat, the vomited matter contains blood altered by the secretions ("coffee-ground vomit"), and the pain comes on immediately after taking food, and is very lancinating. In either case the vomited matter may contain cancer elements.

Loss of appetite, with the general cancerous cachexia, are prominent symptoms, the latter being well marked, with great emaciation. The physical examination is most important. A hard, uneven, immovable tumour is felt an inch or two below the liver, to the right side, although it may be dragged to the left. When the pylorus is affected, the stomach is large and distended. The percussion is tympanitic, and Hippocratic succussion may be developed from the presence of fluid food and air. By grasping the stomach, we limit the motion of the fluid; and thus the size of the stomach may be seen as well as an exaggerated peristaltic motion giving sometimes an hour-glass appearance, and beginning at the left hypochondrium.

The bowels being to a great extent empty, undue prominence of the epigastrium is a not uncommon sign.

The duration is important, as it never exceeds two years.

The following points are of practical importance in distinguishing cancer of the stomach from simple gastric ulcer. The cachexia, the constant pain, the occurrence at middle life, and, more important than anything else, the detection of the tumour by physical signs, are characteristic of cancer; while a youthful age, the female sex, *copious hæmatemesis*, non-detection of cancerous elements

in the vomited matter, and a paroxysmal circumscribed pain, are peculiar to gastric ulcer. Further, chronic dyspepsia or chronic gastric catarrh differs from both in its history, its longer continuance, the absence of hæmatemesis, and great emaciation, and the fact of the pain being neither persistent nor circumscribed.

Treatment can only be palliative and supporting. Food should be given in small quantities, and—if it is pyloric obstruction—of such a kind as not to add to the discomfort by tending to ferment. Hence animal food is appropriate. Stimulants will often be required, and of these the effervescing ones, as champagne, are best. Laxatives are necessary. In some cases complete emptying of the organ by the “stomach-pump,” and then regulating the diet, does good, or, as a last resource, feeding by the rectum. The vomiting may be controlled by morphia or ice, and the former will be frequently required for relief of pain (F. 71). Cundurango bark has been greatly advocated of late (F. 8a).

CONSTIPATION.

Healthy people, as a rule, have an evacuation from the bowels once every day, and generally after breakfast; yet many in good health have two or three stools in the twenty-four hours, while others only have an operation every second or third day. Constipation, as independent of any acute or chronic disease, may be regarded simply as a deviation from the usual routine, and as such may be considered, to a certain extent, an independent disease. The accumulation of fecal matter is frequently due to a sluggish condition of the colon, and is attendant on old people, chlorotic females, persons having little exercise, and leading sedentary lives, or others who think little of and thus neglect the calls of nature. As a result of constipation there is little appetite, bad digestion, dusky complexion, and low spirits, with a flabby tongue indented at its edges. Sometimes long-continued constipation may lead to the formation of an abdominal tumour, causing jaundice, by pressure on the biliary ducts, or occasioning œdema of the lower extremities by pressing on the vena cava. Exceptional cases have been recorded where no motion was effected for ten or twelve weeks.

Treatment.—A careful regulation of the diet is the most important desideratum in treating habitual costiveness. For this

purpose the food taken should be carefully chosen and slowly masticated. Brown bread is serviceable, and ripe fruits may be taken early in the morning. Idiosyncrasies of diet should be studied, and habitual exercise insisted on. In addition to these means nature should be solicited at a certain hour daily, the best being immediately after breakfast. All pills or strongly purgative medicines should be avoided. Of mineral waters, the Hunyadi Janos can be strongly recommended. A wine-glassful taken every morning about an hour before breakfast usually induces a stool neither too loose nor copious. Friedrichshall and Pullna waters are also very useful. The Tamar Indien is serviceable, especially if constipation is associated with piles. A cold shower bath is advisable in the mornings, if there is a healthy reaction afterwards. For very old people stimulating the intestinal muscles by kneading and rubbing will often prove effectual. One-sixth to one-fourth of a grain of the extract of belladonna in constipation associated with dyspepsia is useful.

COLIC.

Colic is accompanied by severe twisting pain, especially about the umbilicus. This pain occurs in paroxysms, is unaccompanied by fever, and is relieved by pressure. The bowels are usually found to be constipated, and bile or mucus may be vomited during the attack. -

As various diseases of the abdomen have pain as a prominent feature, it may be asked, What significance for diagnostic purposes has such pain?

In reflecting on this it is useful to remember that the pain of peritonitis is persistent, increased by pressure, and general over the abdomen; the pain of the passage of a gall-stone has a localised area in connection with the gall-bladder, and the vomiting is generally severe; the pain of a urinary calculus is in the back and testicle, with frequent micturition; the pain of hernia is attended with hernial protrusion.

A peculiar kind of colic attacks painters, or those engaged in occupations which bring them in contact frequently with white lead. The pain is, however, more severe than in ordinary colic, the constipation is great, and a peculiar and characteristic blue line is observed *round the edges of the gums*. These symptoms are fol-

lowed, in advanced cases, by actual paralysis of the extensors of the wrist and fingers, and wasting of the ball of the thumb, constituting what has been termed "the drop wrist."

Treatment.—As colic is generally attended with constipation, and can only be remedied by its removal, it is necessary to give aperients, such as are recommended in the chapter on constipation. An enema is also often beneficial, followed by opium ; or electricity may be tried. For lead colic, iodide of potassium must be given (F. 5).

OBSTRUCTION OF THE BOWELS.

If obstruction of the bowels is diagnosed, it is the first duty of the practitioner, if possible, to elucidate the cause. Naturally he will investigate and make himself certain whether or not it is due to hernia, and act accordingly. Failing to discover any hernial strangulation at its most common sites, the obstruction may be considered dependent on one of three great divisions, according to Dr. Haven :—

1st, Intermural, where, as the name implies, the mucous and muscular coats of the intestinal walls are involved.

a. Cancerous stricture.

b. Non-cancerous stricture. Comprising—

1. Contractions of cicatrices following ulceration.

2. Contractions of walls of intestines from inflammation, non-cancerous deposit, or injury.

c. Intussusception.

d. „ associated with polypi.

2d, Extramural, or those causes acting from without, or affecting the serous covering.

a. Bands and adhesions from effusion of lymph.

b. Twists or displacements.

c. Diverticula.

d. External tumours or abscesses ; diaphragmatic, omental, or obturator hernia.

3d, Intramural, or obstructions produced by the lodgment of foreign substances.

a. Foreign bodies, hardened fæces ; or, should the obstruction be due to cancerous stricture, the sigmoid flexure of the colon or rectum is usually affected, and, in addition to the obstruction, there will also be evidences of the cancerous cachexia.

The condition known as intussusception is not uncommon in children, and is similar to what occurs when the finger of a glove is pulled within itself. The most common invagination is ileo-cæcal—that is, the passage of the ileum and cæcum into the colon preceded by the ileo-cæcal opening. It occurs most frequently in children, and on account of the greater mobility of the colon at that age the invagination often makes its way in a few days through the whole colon, and appears in the rectum immediately above the anus, through which it is even occasionally prolapsed. Violent colic followed by vomiting are first symptoms. Next come, through increased peristaltic action, acute diarrhoea with bloody stools, these bloody stools being peculiar to this acute form of intestinal obstruction. Violent tenesmus and paralysis of the rectal sphincter are later phenomena. The course of such invaginations in children may be acute, and lead to complete occlusion and death in from three to six days, or in a few hours from shock. In other cases, and especially in adults, separation and gangrene of the intussuscepted portions may take place gradually, and the fatal termination may not occur until the second or third week. Or the course may be chronic, the swelling may disappear, and the canal of the intussuscepted portion becomes permeable, and the fatal termination may be delayed with alternate diarrhoea and constipation for a year. A more fortunate result is when, spontaneously or by suitable treatment, the invaginated part is withdrawn without separation into its normal position.

Should the obstruction be due to bands or twists, the lower part of the ileum is the most frequent seat.

Symptoms.—The principal symptoms of all forms of

bstruction of the bowels, with the exception contained in the preceding remarks, when completed, are—

1st, Vomiting, ultimately becoming fæcal.

2d, Pain, varying in severity.

3d, Increasing tympanites.

4th, Hiccup and constipation.

5th, Inflammatory signs, taking effect on the pulse and temperature.

Vomiting will naturally be most marked and early when the obstruction is situated at the upper part of the intestine; and, if unrelieved, death will occur in five or ten days; if in the colon, it may be delayed for weeks. Sometimes, by carefully feeling the abdomen, the point of obstruction can be detected by increased fulness and diminished resonance over this particular spot. Besides this, hyperdistension is seen above, and diminished distension below, the obstruction. This is best seen when the obstruction is low, and the gradual filling of bowel above it may be observed, with sometimes the coils of intestine marking themselves against the abdominal wall.

Treatment.—At first, when the diagnosis is somewhat uncertain, castor oil or an enema may be given, but neither should be continued if it becomes clear that there is a mechanical hindrance to the passage of fæces. The two principal points then are,—endeavouring to sustain the strength of the patient by means of beef-tea and milk, and the relief of pain by opium and hot fomentations. Ice should always be given freely to allay thirst. Opium may also do more than relieve pain; it will stop vomiting; it arrests violent and useless peristaltic action; it favours the accumulation of liquid contents above the obstruction, and by the combination of these factors may aid in its removal. To adults it must be given until slight narcosis is produced. Brinton says it is inadvisable to stop all peristaltic action, and suggests as a happy compromise the combination of opium with belladonna—ext. of opium 2 parts, with ext. of belladonna $\frac{1}{2}$ part. In cases of *intussusception* in children, when the prolapse

is perceived in the rectum, reduction should be attempted under anæsthesia as early as possible by the hand or the sponge sound, followed by injections of water and air after the previous reduction has preceded as far as it possibly can, viz. into the lowest part of the sigmoid flexure. If invagination is fixed and chronic, if there are signs of gangrene, prudence forbids all attempts at reduction. Thus calling time to our aid by the means indicated, nature may, in her own way, remove the obstruction, unless, of course, it is due to an unremovable cause.

At an early stage, before there is any possibility of gangrene having set in, the patient may be placed on his back, with his pelvis raised, and a long stomach-pump inserted into the rectum as far as it will go. Then warm water should be slowly thrown up until the bowels become distended. When this occurs the coils of intestine should be moved on one another by the hand placed on the abdomen. In this way, or by means of air instead of water, cases have been successfully treated; and besides, we can by this means form an idea of the position of the point of obstruction by the amount of water capable of being thrown up.

In some cases it is necessary to nourish by stimulating enemata.

Should gastrotomy be resolved on, the advice of a surgeon ought to be obtained; keeping in mind, however, before resolving on this, that not a few cases are spontaneously cured by nature in ways we are not well acquainted with.

DIARRHŒA.

Diarrhœa is rather a symptom than a disease, yet, when the discharge from the bowels is great, special treatment may be required for its relief. The character of the stools varies. Thus, they may be fæcal, although liquid, bilious, watery, mucous, or thin serous. Diarrhœa is a prominent symptom in typhoid fever, phthisis, various kidney, liver, or nervous affections. It may also result from dentition, errors of diet, influence of the season, malaria, or mental emotion. Sometimes it is

“vicarious” and dependent on the rapid suppression of discharges or absorption of dropsical fluid. In all cases the stools should be carefully examined, as much information can thus be obtained with regard to the cause of the diarrhoea. A severe kind of diarrhoea, called by some English cholera, is accompanied by pains in the abdomen, cramp in the legs, and dark bilious evacuations.

Treatment will depend entirely on the cause. It is frequently inadvisable to check it, as it is nature's outlet for carrying away offending matter from the intestinal canal, or for relieving other organs which are diseased. Thus, if due to indigestible food, it is better to promote it (for this is the easiest way to stop it) by giving tincture of rhubarb or castor oil; if occurring in Bright's disease, it should not be interfered with, unless it produces great exhaustion. Should no direct cause be ascertained, it may be desirable to check it in whole or in part. The various preparations of opium or other astringents, as sulphuric acid, catechu, tannin, etc., are serviceable for this purpose (F. 16, 17, 20).

Boiled milk and lime water are very useful in the diarrhoea of children, preceded by a few grains of gray powder if the motions are green and offensive (F. 8).

In severe cases all solid articles of food, vegetables and fruit, should be forbidden, and the diet should consist of arrowroot, milk, and boiled rice. The local application of poultices and hot fomentations helps to relieve the pain.

DYSENTERY.

Dysentery consists chiefly in inflammation of the mucous membrane of the large intestine. The inflammation rarely involves the deeper layers, or extends past the ileo-cæcal valve. It is supposed to commence in the solitary glands that lie scattered over the surface of this portion of the intestine. These become enlarged and prominent, looking somewhat like small-pox pustules. They probably form the foci for most of the ulcers, which are sometimes narrow and oblong, lying across the gut; sometimes very large and irregular, with great patches of thickened mucous membrane. In tropical climates the liver is specially disposed to suffer, and ordinary or septicæmic abscesses may occur. So also the spleen and pancreas may be enlarged, softened, or indurated, and

become the seat of abscess. The lungs may be similarly involved, and the bronchial tubes may be filled with puriform exudation, or fully-developed abscesses may be observed.

The site and extent of the ulcerations vary. The sigmoid flexure is a common site; the cæcum in certain cases and the rectum in others are principally implicated. In some severe instances the whole gut is covered with ulcers, while in fatal cases—Virchow's diphtheritic or gangrenous dysentery—the entire tract of the large intestine is a tattered mass of disorganisation, the natural appearance of the mucous membrane being lost. It is covered with discoloured patches, with fibrous shreds, and mingled mucus, pus, and blood.

Dysentery not arrested in its early stage by treatment and not rapidly fatal is termed chronic, and the condition is doubtless occasioned by structural changes in the bowel, *i.e.* thickening and imperfect cicatrisation of the ulcers and the permanently injured state of the glandular structures.

Dysentery may be either epidemic or sporadic. The former is peculiar to tropical climates, and seems dependent on a miasma emanating from the soil, attacking the system generally, and locating itself in the intestine; the latter may occur in all sorts of places, in adults as well as children, and is the result of the lodgment of masses of faecal matter in the lower bowel, which act as foreign bodies, giving rise to inflammation ending in dysenteric symptoms. In neither form is the disease contagious.

Symptoms.—Dysentery begins in both its sporadic and epidemic variety with diarrhoea, after there have been irregular stools or constipation. There are also lassitude, want of appetite, and a listless attention to ordinary occupations. On the third or fifth day, usually in the night, the diarrhoea becomes more severe, and attended with shivering or rigors. Pain is felt in the abdomen. The desire to go to stool is intense. Little faeces after a time are passed, and there is a straining or burning pain at the

nus and rectum (tenesmus). With the disappearance of the feces there appears bloody mucus, or pure blood, in the midst of which are often seen little white clumps, or round bits looking like minced raw meat.

The patient may seek to go to stool from twenty to thirty times in a night, and then, as might be expected, becomes giddy and faint from loss of blood and exhaustion. The disease may last in this acute form from six to eight days, with remissions in the morning and aggravations at night. As symptoms of amendment may be mentioned alternations of mushy even-formed stools with the characteristic bloody mucous ones. In very severe cases the tenesmus increases; the dejections flow uncontrolled, and are largely mixed with blood, collapse sets in, and the patient dies of asthenia.

When the disease becomes chronic, it is very intractable, with frequent relapses, offensive discharges, and great pain and exhaustion. Sporadic dysentery generally terminates favourably. The mortality of the epidemic form may reach 40 or 50 per cent. In slight cases convalescence is complete in about three weeks, medium severe cases in about seven weeks. Severe cases, if they do not terminate fatally on the eighth or ninth day, may last an indefinite length of time.

Treatment.—During an epidemic of dysentery all unnecessary crowding should be avoided, and uncleanness prevented. The discharges of the patient should be disinfected. Potatoes, salads, unripe fruit, greasy food, spices, or pickles, should not be taken; while ripe fruit and stewed apples are advantageous. Flannel bandages should be worn round the abdomen; and if the bowels are constipated a gentle laxative of rhubarb may be taken.

Should an attack of dysentery set in, the patient must remain in bed in a room of an equal temperature. The diet should consist of milk, strong soup, yolk of eggs; the *object of the dietary* being to form small not bulky stools. *Thirst is alleviated* by meal-gruel, and the tenesmus by

starch enemata, with 5 to 10 drops of laudanum in each. Leeches ought to be applied at the commencement of the attack to the anus, and afterwards, according to some continental authorities, what is termed the cathartic or laxative treatment adopted. Thus give an emetic of vin. ipecac., follow this up by castor oil or tamarinds. On the second day they may be omitted, and morphia substituted in the evening. On the third day the laxatives mentioned may be administered again, and repeated on the fifth or seventh day (Heubner).

Two grains of nitrate of silver to four ounces of water are recommended as an enema. Pulv. ipecac. in full doses forms the mainstay of English treatment; and there is no doubt, from the personal experience of those who have seen the disease in India, that its effects are wonderful. Thus it is recommended to give 25 grs. of the powder, with a little syrup of orange-peel and 10 grs. of carbonate of soda, to neutralise acidity. No fluid should be taken for three hours, although, if the thirst is great, ice may be sucked occasionally. In from eight to ten hours a smaller dose may be given, and, if necessary, repeated according to the urgency of the symptoms. It is advised, however, to give 10 to 12 grains at bed-time for a night or two after the stools appear healthy. As a rule, the system is tolerant of the large doses mentioned, and no sickness is produced.

Rest in bed or in the recumbent posture is also essential, and if there be abdominal pain or tenderness hot fomentations or turpentine stupes should be sedulously applied. It is generally found that under such treatment in the early stage of acute dysentery the pain diminishes, the tenesmus is relieved, the restlessness is abated, the fulness and desire to go to stool pass away, and the skin becomes moist. The motions also become fæculent, and assume a peculiar yellow appearance, significant of the action of the remedy. To combat any remaining irritability 10 to 15 grains of Dover's powder are beneficial; and should inaction of the bowels result from the treat-

ment mentioned, small doses of castor oil may be given to aid in expelling mucus.

In the very severe forms the object is to prevent collapse; hence alcohol, interdicted in the milder varieties, must be given, and strong soups at frequent intervals. When the disease has reached the advanced stage of ulceration, and when its chronic character has been fully established, the ipecacuanha is not so specially useful. Other remedies must be tried. Of these vegetable astringents, such as tannin, rhatany, etc., are necessary. Above all, in chronic dysentery, change of air is very essential; a sea voyage often acts admirably. The diet should also be bland and nutritious, rest should be enjoined, and from 4 to 5 grains of Dover's powder taken twice or thrice daily. A bandage should also be worn over the abdomen, and cold baths, with friction afterwards, taken if they are well borne.

EPIDEMIC CHOLERA.

The authentic history of cholera dates back only to 1817, when it made its first appearance in India. After a series of destructive epidemics in the East, it reached Europe, and was imported from Hamburg to Sunderland on October 26, 1831, from thence spreading to the great centres of population in this country. This epidemic lasted during 1831-32, when there was a lull; the next epidemic being in 1848-49; the third during 1853-54; and the last during 1865-66, when it was chiefly confined to London.

Cholera seems, according to the views of most recent authorities, to owe its existence to one single ultimate cause, a cholera germ, which again is supposed to be of a parasitic nature, and develops in the gastro-intestinal tract, in the interior of the follicles of the small lymph and blood vessels, and of the submucous connective tissue. *If the parasitic origin of cholera is granted, it can be understood how in different degrees of vitality these*

germs can be carried by the air in viewless numbers, and impregnate the water supply, or be drawn directly into the mouth; the different degrees of vitality accounting, to some extent, for the choleraic diarrhoea which, as will be seen, always accompanies the true disease. Experience testifies that nurses and hospital physicians exposed to the concentrated miasma from the dejections, or washerwomen who wash the linen soiled with cholera dejections, rarely escape taking the disease when it is epidemic; while the fact of outdoor physicians attached to hospitals passing safely from bed to bed, and again out into the open air, seems to indicate that cholera is not contagious.

Cholera is more common in hot than in cold weather. Although common in childhood and adult life, it is pre-eminently a disease of between twenty and thirty. Excesses of every kind, whether of food, wine, or fruit, during the continuance of the epidemic, predispose to it. The average incubatory period is from twelve to twenty-four hours, rarely exceeding one week. About one-fifth of those attacked survive.

Symptoms.—In this country diarrhoea usually accompanies the cholera epidemic, coming on suddenly, the stools being fluid, painless, yellowish-brown, and in number averaging from two to four in the twenty-four hours. This diarrhoea rarely fails to precede the real attack.

The symptoms of cholera vary greatly in intensity, especially in tropical countries. In many cases the patient, apparently overwhelmed by the poison, falls down, and dies within one or two hours, without vomiting or diarrhoea. In typical uncomplicated cases, as observed among primitive races, the first symptom is always giddiness or swimming in the head; and in a short time the contents of the stomach are suddenly ejected, without much nausea. A peculiar sensation of faintness or sinking is next experienced, and then the bowels are evacuated. In very severe cases the patient becomes pulseless at

the wrist within one or two hours, and before the vomiting or diarrhoea has proceeded to any great extent a cold perspiration covers the body, and although the surface has the cold feeling of a dead body, the patient complains of an intense burning heat, and implores to be sponged with cold water. There is persistent vomiting and diarrhoea, with intestinal cramps; the body becomes shrivelled and corpse-like; the bladder is empty, but there are intense and frequent calls to micturate; the voice becomes croaky; the carotids cease to pulsate, and death supervenes, the body having the appearance of being dried up.

In this country the attacks frequently commence during the night, and the symptoms are less intense. The patient awakes chilly and dizzy, and this is rapidly followed by a tempestuous diarrhoea, the early stools being black and pappy; but as the bile pigment quickly disappears, they exhibit the characteristic rice-water appearance. They are passed involuntarily and painlessly, and in number vary from three to fifteen. After the diarrhoea has lasted one or two hours, vomiting, attended with no pain, sets in, at first of the food which may have been taken, and latterly assuming a colourless whey-like appearance. Intense thirst and suppression of urine are now prominent symptoms. The tongue is, as a rule, white. After a few hours, distressing cramps supervene, especially of the calves and feet—rarely of the hands. Sometimes these are entirely absent, and the patient sinks without a struggle. There is also a considerable fall of temperature, commencing in the hands and feet, and most marked on the face, nose, and tongue. Should there be a tendency to recovery, the temperature approaches the normal; if it does not, the features become more pinched, the extremities more cold, livid, and collapsed; the eyes dry, the cornea cloudy, and the voice assumes a hoarse and raveny character, or it may sink into an inaudible whisper. This peculiar character has led to its being called "*vox choleraica*." This stage has been termed the *algid* or *cold stage*, and either terminates in death or

passes into what is called the stage of reaction. The earliest sign of improvement, preceding even the abatement of the diarrhoea and vomiting, is the return of the pulse at the wrist. Heat follows, the blueness disappears, the temperature becomes normal, and convalescence may be regarded as perfect in from ten to fourteen days. Sometimes the improvement is only transient, being followed by uræmia, or inflammation of the kidneys or intestines. During the attack proper the patient may die in from six to eight hours ; even in bad cases the usual time is, however, twenty-four hours.

Morbid Anatomy.—Cholera has no distinctive lesions; the cadaveric rigidity is, however, marked. In the digestive tract the isolated and agminated glands are swollen and prominent, more especially the latter. At the ileo-cæcal valve, a whitish-gray fluid with fine granules and cell nuclei exudes if the follicles are pierced. These changes are seen during the first forty-eight hours. Afterwards the swelling diminishes, and the glands are shrivelled up, collapsed, and of a yellowish or slaty-gray colour. The brain, heart, lungs, and liver are usually found healthy, while the kidneys are larger than usual, and congested.

Treatment is of two kinds—prophylactic and therapeutic. During a cholera epidemic all unnecessary meetings, fairs, and pilgrimages should be abandoned. The *materies morbi* being chiefly contained in the dejecta, all excreted matter should be disinfected by chemical agents, or destroyed by fire, and none should be so disposed of as to contaminate food or water. Wells ought to be inspected, defective sanitary arrangements remedied, dirt of every kind cleared away, the sale of unripe fruits and vegetables prevented, soup-kitchens established, and the stamina of the poor built up. The prodromic diarrhoea should, if cholera appears, be checked as early and speedily as possible by, according to Lebert, some preparation of opium, given either by mouth or rectum. *Should these fail, we must now fall back on, or as some*

eminent English authorities say, commence with, a tea-spoonful of castor oil or rhubarb.

The therapeutic treatment of cholera, when it has actually begun, is very unsatisfactory; for the disease runs an extremely rapid course, and all medicinal agents are speedily rejected. Astringents are of no avail, and in fact do harm. While no distinct line of treatment applicable to all cases can be laid down, yet the following course of procedure should, if practicable, be adopted. The first two or three hours are those upon which everything may depend. The physician should, if possible, remain beside his patient or patients for an hour or two, having a pocket case containing morphia, hydrocyanic acid, and carbolic acid of the purest quality, and be ready to administer these as occasion may require. (F. 18a) will be found very useful. Three or four minims of carbolic acid should be added to each dose. The first dose is generally rejected, but a second dose given immediately afterwards is usually retained. If a case is seen early and is amenable to treatment, there can be no doubt of the benefit of carbolic acid. After being given for an hour or two at regular intervals, the vomiting ceases, and fluids are absorbed; the pulse reappears, and there is a reasonable hope of recovery. Ice should be placed on the tongue every few minutes, and carbonic acid water drunk. Morphia may be injected subcutaneously to allay the pain and cramps, and sinapisms applied over the abdomen, while the legs are rubbed with some stimulating liniment. Should the temperature begin to fall, enveloping the patient in a blanket wrung out of hot water and sprinkled with turpentine, together with the internal administration of the same drug, was, in my experience, successful during the last London epidemic. In rapidly sinking cases brandy or champagne may be given (F. 72).

When reaction sets in, a large spoonful of good beef-tea may be taken every three hours, and later on, tea or coffee with milk several times a day. From this we may *pass to a more increased and solid diet.*

What is termed the saline treatment of cholera consisted in giving in the early stages a Seidlitz powder, and, after this had acted, plenty of thin beef-tea well seasoned with salt; thirst being relieved by Seltzer, soda, or pure water *ad libitum*. By the treatment in this stage a cure was often obtained; if, however, the stage of cramp had been reached, a solution of chloride of sodium $\mathfrak{D}\text{i}$, bicarbonate of soda $\mathfrak{z}\text{ss}$, chlorate of potass gr. vii was given every half hour, by the mouth. If there was collapse and an imperceptible pulse, a strong solution of the same salts, dissolved in hot water at a temperature of 105° Fahr., was slowly thrown up the rectum. This line of treatment is still by some strongly advocated, and astonishing, though unfortunately only partial and temporary, rallyings from the stage of collapse have been recorded.

"The best treatment of cholera," says Lebert, "therefore, in the state of existing knowledge, is a carefully-regulated hygienic and a correctly-interpreted symptomatic treatment, with avoidance of all perturbatory efforts, in the last degree inutile if not even injurious."

INTESTINAL WORMS.

Of the different intestinal worms which inhabit the human body there are two great varieties—the hollow worms and the solid worms. In the first class we find three species of *tænia*, the most common being the *Tænia solium*. Its length varies from two to ten yards or more, and its habitat is the small intestine. It consists essentially of a head and segments. The head is about as large as a small pin's head flattened, with a double circle of hooks, around which are four suckers or mouths by which it attaches itself to the intestine. The segments, joints, or *proglottides*, are rectangular, and possess male and female organs opening into a common aperture retaining the ova, which, when ripe, contain a six-hooked embryo. The joints are at first more broad than long, but as they diminish in distance from the head they

become smaller and smaller, and the length exceeds the breadth. The *Cysticercus cellulosæ*, a parasite chiefly resident in pigs, seems to be the parent of the *Tænia solium* in man, and from uncooked or improperly cooked pork the tapeworm is developed in the human body. How does the tapeworm develop in the human body? The answer to this inquiry and explanation of the statement preceding it is as follows:—Segments containing abundant ripe ova are passed per anum and scattered about in various ways, and so swallowed by animals, notably pigs, oxen, and sheep, mixed with their food. In the alimentary canal of these animals the shell bursts, the embryo escapes, attaches itself to the mucous surface, works its way into the tissues, and when it reaches a suitable spot, still further develops and presents a head and neck with a vesicular or bladder-like appendage. In this stage the worm is termed cysticercus or bladder-worm, and may be seen in the muscles, liver, and brain of various animals. If the cysticercus thus existing in the flesh of animals is permitted to enter the alimentary canal of a human being, it becomes attached by its head, the vesicle falls off, and a succession of segments form, constituting the ordinary tapeworm.

Symptoms.—The only phenomenon which seems to indicate the presence of the parasite is the appearance of segments in the fæces. Sometimes the victims of tænia also complain of pain in the belly, unsatisfied appetite, thirst, great depression of spirits, with itching of the anus or nose.

Varieties.—*Tænia mediocanellata* resembles very much the former variety, but it has only a sucking apparatus in the head, and no hooks. It appears to result from the further development of a *cysticercus* infecting cattle, and owes its introduction into the system to the eating of improperly cooked beef.

The *Bothriocephalus latus*, peculiar to Switzerland, Russia, and Poland, is the largest of all the tapeworms, sometimes attaining a length of twenty-five feet and

upwards, each foot containing a hundred and fifty segments or joints, and each joint having its own male and female organs. The head is club-shaped, with a longitudinal slit, by which it attaches itself, but no suckers.

Treatment.—When the presence of the worm has been discovered, the best way to expel it is to tell the patient to take no food for eight hours, then to administer in the evening 30 m. of the ext. of male fern in a draught of peppermint water. Follow this up in the morning with a dose of castor oil, and about midday by a large plate of mashed potatoes. The head and segments will probably be thus forced away; if not, let the same treatment be adopted on a subsequent occasion (F. 29).

The bark of the pomegranate root, or kousso, or oil of turpentine, are all well-known anthelmintics, but inferior to the male fern.

ROUND WORMS

possess a distinct integument and an alimentary canal, with a mouth at one end and an anus at the other. The sexes are always separate. In the male the general pore is near to the anus, in the female about the middle of the belly.

1st, *Ascaris lumbricoides*, the common round worm, resembles much the common earth-worm. The female is nearly twice as large as the male. Its habitat is the small intestine, generally of badly-fed children, but from this it may creep upwards to the stomach or to the colon, and it has also been found in the nose, hepatic or pancreatic ducts. Authentic records indicate that a large number of *lumbricoides* may be in the body at the same time. As a rule, however, they rarely exceed five or six. They may penetrate the intestinal wall to the peritoneum, causing an abscess near the umbilicus. The symptoms are obscure and various. Generally speaking, there are thirst, disturbed sleep, fever, and depraved appetite, with itching of the nose and anus.

Treatment.—The best remedy is santonin given in doses of one to three grains twice daily to a child, or double that quantity to an adult. Turpentine may also be given if preferred (F. 30).

2d, The common thread-worm (*Oxyuris vermicularis*) is small, white, and thread-like, the female being about the third of an inch long, the male about half that length. They exist in the colon or rectum, generally in great numbers at a time, and infest children who are badly fed or in indifferent health. The chief symptom is itching at the anus or at the nose, with bad breath, and generally indifferent health. The diagnosis can easily be confirmed by observing them in the fæces.

Treatment.—Enemata of cold water, of infusion of quassia, or tea, or liq. calcis, repeated daily, are sufficient to kill the oxyures, with occasional doses of hydrarg. c. cret. For adults, perchloride of iron, half an ounce to a pint of water, is recommended.

The whip-worm (*Trichocephalus dispar*) and the *Sclerostoma duodenale* are rarely seen in this country, although the former is sometimes observed in people who have died of typhus or enteric fever.

TRICHINA SPIRALIS—TRICHINOSIS.

The *Trichina spiralis* is met with in the muscular tissue in the form of a minute worm, which lies coiled up in the interior of an oval cyst, giving to the naked eye an appearance like minute white grains. These trichinæ are discovered chiefly in the flesh of pigs, and it is from the use of trichinous pork that man has become affected. Pigs again, it is supposed, obtain the disease from rats. The trichinæ cysts are dissolved by the gastric juice, and the parasites set free. Sexual maturity is developed; the ova and the living embryos at once commence active migration, finding their way into the small vessels or lymphatics of the bowels, and thence they are conveyed over the body. In this way they enter the

intestine, irritating it in their passage, getting to the intermuscular tissue of the trunk and limbs, and thence penetrating the muscular tissue and destroying it.

Symptoms.—The symptoms attending trichinosis in severe cases are somewhat typical. There is first intestinal disturbance, not unlike that of typhoid fever, with coated tongue, diarrhoea, and great prostration. If fever exists it is but slight, and it is accompanied—even from the first—with a remarkable increase of perspiration. Secondly, there is also so-called “muscular lameness,” followed by muscular inflammation, pain, and tenderness not unlike rheumatism, with stiffness and rigidity over the voluntary muscles. On the seventh day the diagnosis becomes easier, for there is cedema of the face and eyelids, and this cedema is not attended with albumen in the urine, thus excluding any suspicion of the kidneys being implicated by Bright’s disease. The further progress of the disease is marked by general prostration, by attacks of dyspnoea, by hoarseness, by profuse sweats, and sleeplessness.

It is difficult to form a positive prognosis in any single case of trichinosis, for its severity, duration, and termination depend upon the number of trichinæ introduced into the system by the meat eaten, and this again varies with its mode of cooking. The less thoroughly the meat is prepared, the less it is exposed to heat, the more severe will be the illness, and a more unfavourable prognosis will also extend to those cases where the early symptoms are violent than where they are mild and long delayed. Long-continued diarrhoea and pre-existing disease are especially unfavourable; in some cases recovery taking place in a month, in others in three or four. In some outbreaks the mortality is small, in others as high as 25 per cent, and death may result from peritonitis, pneumonia, or debility.

Treatment.—We can only treat symptoms, as we know of no remedy specially adapted to kill the parasites. Prophylactically, avoid raw or underdone pork or German sausages.

PERITONITIS.

The peritoneum or serous membrane lining the abdominal and pelvic cavities, and investing the viscera, may suffer from acute or chronic inflammation. The inflammation is precisely similar to what occurs in all serous membranes, viz. capillary congestion, redness, more or less loss of polish, exudation resulting in a thin grayish lamina, which ultimately becomes thicker, and ribbed or villous according to position. The surface of the intestine is injected, the intestines are slightly glued together with soft yellow-gray lymph stretching from one fold of the peritoneum to another. In the pelvic cavity there is turbid fluid, in which float flakes of lymph. The fluid effused is chiefly observed in chronic cases, and tends naturally to gravitate to the lower and more dependent parts, *e.g.* into the pelvis and lumbar regions, where it may escape observation; or, if excessive, distend the abdominal walls. This fluid may be clear or bloody, or become rapidly or slowly purulent.

Peritonitis, even though of local origin, tends to spread until the whole of the peritoneal surface is involved; and convalescence, should it occur, is attended with absorption of the fluid, organisation of the false membrane, and thickening of the peritoneal surface, with adhesions of adjacent organs. Should the fluid be purulent, it may form an external abscess, or escape into the intestines.

Causation. — Peritonitis is occasioned by injuries, hernia, perforations, and extension of disease from neighbouring parts; it is also the result of various blood diseases, as puerperal fever, tubercle, Bright's disease; sometimes it is acute and idiopathic, and due to exposure or wet.

Symptoms. — In the acute form, however occasioned, the symptoms are marked by fever, and with the fever there is pain in the abdomen, increased on pressure or by the *slightest* movement. The patient lies in bed with

the legs drawn up. The face is anxious and pinched, and the abdomen is tympanitic, tense, and hot. Vomiting is often present, and when so naturally aggravates pain. The urine is scanty and high-coloured, the pulse is rapid, hard, and wiry, the tongue parched, and the respiration quick and shallow. Should the disease take a favourable turn, the gravity of the symptoms abates, the fever diminishes, and the pulse becomes normal. If, on the other hand, a fatal issue is to result, the abdomen becomes distended, the pulse thready, the extremities cold, and collapse sets in, with or without loss of consciousness. Death may occur as early as the second or third day, or it may be delayed for a week.

Treatment.—This consists in enforcing absolute rest, and maintaining the position which is instinctively assumed, at the same time guarding the patient from the unnecessary weight of the bed-clothes by means of a cradle. Should the disease be idiopathic and seen early, leeches should be applied to the abdomen, and the bleeding encouraged by hot fomentations. Opium should also be given by the mouth or by rectum, or morphia injected subcutaneously in such quantities as will ensure relief from the pain.

The strength must also be sustained by liquid nourishment—beef-tea, eggs, and milk. In very acute cases an ice-bag over the abdomen, with two or three layers of flannel between, is very useful. If perforation is suspected, abstinence from food or stimulants, and nourishment by enemata, are indicated. Ice to suck is very grateful, and mitigates vomiting. Treatment by blisters has been advocated, but the inflammation is too general for such treatment.

CHRONIC PERITONITIS

sometimes follows the acute affection; generally, however, *it is an independent affection, associated with the strumous diathesis.* Numerous miliary granules lie within

or immediately beneath the membrane, especially in the folds of the peritoneum which compose the omentum. When there are symptoms of chronic peritonitis, with evidences of a strumous constitution and no history of a previous acute attack, Louis seems to think that these granules will always be found.

Symptoms.—These are obscure, and steal on the patient in a very insidious manner. Usually pricking pain is experienced in the abdomen, and the belly gets full and tense. The pain is increased on pressure. There are also loss of appetite, nausea, fever, and progressive emaciation, with diarrhoea. After a time the effusion of fluid takes place, the abdomen enlarges, and fluctuation is felt. With this tubercular peritonitis there is often combined disease of the mesenteric glands, phthisis, etc. The fluid does not gravitate so freely on account of adhesions, and this condition, with the thickening of the peritoneum, serves to distinguish this affection from ascites. Another useful sign, when it can be detected, is friction sound, heard by the ear or stethoscope, and produced by respiration or movement of the abdominal wall. *Tabes mesenterica* is a name given to a tubercular or strumous degeneration of the mesenteric glands, and is by some termed “abdominal phthisis.” It is peculiar to young children of a strumous diathesis, and presents features very similar to those previously mentioned. There is always more or less pain in the belly, and to ease this the child instinctively draws up its legs. The abdomen, in a fully developed case, is tense and swollen, and over it the abdominal veins are seen distended. The body is thin and wasted, the appetite capricious, the bowels relaxed, and motions sour-smelling. The evening temperature is increased, and the disease ends fatally, either by exhaustion or through the lungs becoming also the seat of tubercle.

Treatment.—Mild nutritious diet—milk, beef-tea, etc.; iodine ointment applied externally; while internally syr. iod. ferri and cod-liver oil must be administered. These

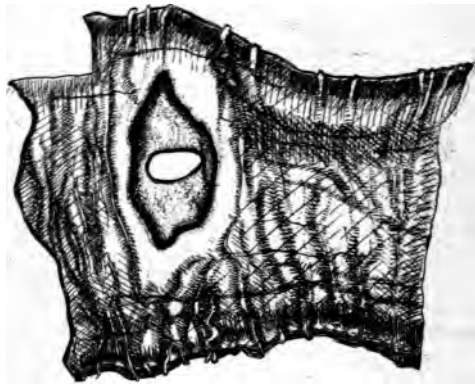
cases are very unpromising, and unless chronic peritonitis is the consequence of the acute attack, not much benefit will ensue from any form of treatment. Opium fomentations, or even blistering, may be used if the severity of the symptoms indicates them.

In *tabes mesenterica* the treatment is similar to that recommended under Tuberculosis, but the prognosis is necessarily gloomy if the disease is well established.

TYPHLITIS AND PERITYPHLITIS.

In the right iliac fossa lie the cæcum and its appendix, only anteriorly and laterally covered by peritoneum. Inflammation not unfrequently attacks this particular part of the intestine, and if the inflammation affects the mucous surface and the coats of the cæcum, it is termed typhlitis (*τυφλος*, blind; terminal *itis*); while if the areolar tissue connecting the cæcum to the psoas and iliacus muscles is also involved, the term perityphlitis is employed.

Various causes may originate the inflammation. Thus concretions may accumulate in the vermiform appendix, or bits of bone, pins, bristles, etc., may stick there, or any of the intestinal ulcers may perforate the bowel at the place mentioned. Should the perforation occur where the bowel is free from peritoneal covering, faecal matter escapes directly into the surrounding tissues, leading to inflammation and abscess, which may take a varied course; at one time opening into the rectum, or forming a swelling in the groin, or passing downwards along the psoas and iliacus muscles to point at the upper part of the thigh. In the majority of cases it presents itself in the iliac region in the position which the cæcum usually occupies, from whence it may be discharged either by one of the ways previously alluded to, or it may again enter the cæcum by its original orifice; or a series of sinuses may be formed, which never entirely close.



SIMPLE ULCER OF INTESTINE.

LIMITED IN AREA, PUNCHED OUT APPEARANCE.
TERMINATING IN PERFORATION: PERITONITIS.



TUBERCULAR ULCER OF ILEUM.

WILLS COMPOSED OF MUCUS GATHERED INTO A HARD
CIRCULAR MASS, CENTRAL AREA COVERED PERMANENT FLOOR.

Should perforation take place directly into the peritoneal cavity, fatal peritonitis will of course result.

Symptoms and Progress.—The early symptoms are pain and tenderness in the iliac region, with rigors and fever. The patient lies on the right side, with legs drawn up. If the abscess forms and extends downwards, the symptoms are obscure; if it tends to point anteriorly, the fulness and hardness become more pronounced, and the contents may be discharged into the bowel, or externally by an artificial anus. Should the discharge be into the peritoneum, the local symptoms of pain and tenderness will not be confined to one particular spot, but be general over the abdomen, occasioning great suffering and death in a few hours.

The duration of typhloitis is uncertain, sometimes ending in speedy recovery, or in death from a lingering and obscure illness.

Treatment.—Locally, leech and apply hot fomentations or poultices. Internally, avoid giving drastic purgatives. Keep the bowels quiet with opium in any of its forms. Give only liquid food, and allow wine or brandy, should exhaustion or suppuration appear.

Should the bowels not open naturally, castor oil may be taken if enemata fail.

INTESTINAL ULCERATIONS.—The ulcers characteristic of typhoid fever and dysentery have already been described under these diseases. The bowel may, however, become the seat of ulceration of a non-specific character, as the result of inflammation from various causes, as foreign bodies, calculi, hardened fæces, etc.; or the ulceration may be specific and associated with tubercle. The latter variety, tubercular ulceration, is frequently observed in scrofulous children, while if seen in adults it is generally secondary to pulmonary phthisis. Tubercular ulcers affect chiefly the lower portion of the small intestine, and gradually cease towards the jejunum. Their position is transverse as regards the bowel, the margins and floor are

thickened; sometimes imperfect cicatrisation may be observed, the edges being drawn together and leading to contraction of the gut and even stricture. The characteristics of the simple and tubercular ulcer are seen in the engravings.

DISEASES OF THE LIVER.

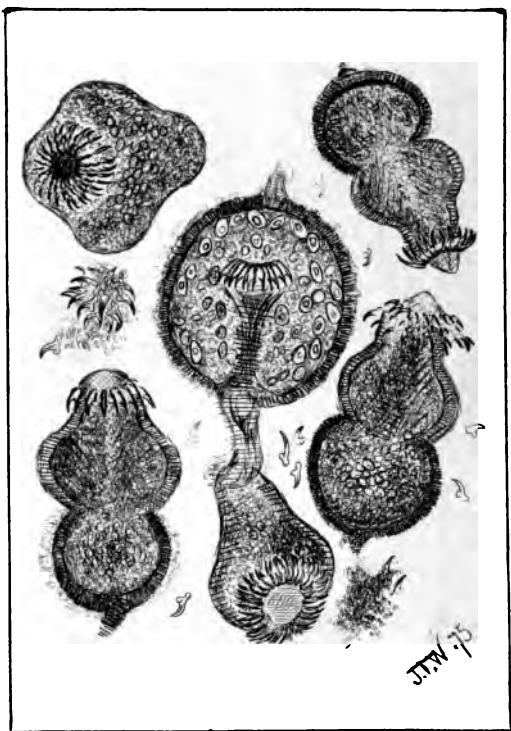
The ordinary extent of hepatic dulness in an adult of average size is 4 inches in the right mammary line, *i.e.* a line descending perpendicularly from the right nipple; $4\frac{1}{2}$ or 5 inches in the right axillary line, 4 inches in the right dorsal line, *i.e.* from lines drawn respectively from the centre of the axilla and from the lower angle of the scapula; 3 or 4 inches in the median line anteriorly, *i.e.* in the line of the ensiform cartilage.

Its position is somewhat arched. Commencing posteriorly about the tenth or twelfth dorsal vertebra, it ascends gradually towards the axilla and the nipple, and then again descends slightly towards the median line in front.

The liver may become enlarged from the normal dimensions given, and as this enlargement is a character common to many diseases of the organ, it has been happily suggested by Dr. Murchison to divide these, for the purposes of diagnosis, into Painless and Painful Enlargements. Painless enlargements are further characterised by an absence of jaundice and by a very chronic course; but in the painful enlargements jaundice is a very common symptom, and the progress is more rapid.

Among painless enlargements we have the so-called amyloid liver, the fatty liver, hydatid tumour of the liver, and simple hypertrophy.

Among painful enlargements we have congestion, catarrh of the bile ducts, obstruction of the common duct and retention of bile, cancer, pyæmic and tropical abscesses.



TÆNIA ECHINOCOCCUS.
FROM HYDATID CYST OF LIVER.

PAINLESS ENLARGEMENTS OF LIVER.

Waxy, Lardaceous, or Amyloid Liver.—The liver may attain, under this disease, a great and uniform size, with a rounded, well-defined lower margin. The growth is slow and imperceptible, extending over many years, with constitutional symptoms of anæmia, and frequently with evidences of a similar disease in kidneys, stomach, and spleen, the latter being often enlarged as well as the liver. The conditions favouring this degeneration are, as in the kidney, constitutional syphilis or other exhausting diseases. From the nature of the disease it may be expected that it can hardly result in recovery, although its progress may be somewhat arrested.

Fatty Liver.—The enlargement is considerable, but not so great as in the previous form. To the feel, if the abdominal walls are thin, it seems soft and doughy, and can easily be pushed aside by the finger without causing any pain. Many and opposite conditions of the system may give rise to fatty liver. Among these may be specially mentioned alcoholism, phthisis, and general obesity, so that it may rather be considered as an adjunct to other constitutional states than a disease *per se*. Dr. Addison considered a greasy, velvety condition of the skin characteristic of fatty liver. On post-mortem examination the liver is found to be pale, staining the knife with grease on cutting into it. The disease is most marked round the lobules; the cells being enlarged and containing fatty globules.

Hydatid Tumour depends on the development in the liver of the larvæ of the *tænia echinococcus*, which inhabits the intestines of the dog. The ova are supposed to be voided with the fæces of the animal, and to enter the human system by means of food and drink, finding their way to the liver or other organs in an unexplained manner. Hydatid tumours of the liver, unlike those previously considered, are not uniform in their direction, but

usually follow one direction in particular, either upwards, downwards, or laterally; hence the tumour formed may burst into the peritoneum, stomach, intestine, or lung. Sometimes it may suppurate, or it may dry up. The commencement is usually insidious, and the tumour, smooth and elastic, may attain a great size without the patient being aware of its existence, as the general health may be unaffected, there being neither dropsy nor jaundice. When detected, the painlessness and the absence of the peculiar cachexia distinguish it from cancer; the history and the absence of constitutional symptoms from abscess; the position and non-jaundiced appearance of the patient from enlarged gall bladder. Occasionally, if near to the surface, there is a sign elicited by percussion, known as "hydatid vibration," characterised by a peculiar trembling sensation being imparted to the three fingers of the left hand when they are laid flat on the tumour, and the back of the left middle finger is struck abruptly with the point of the middle finger of the right hand.

In *Simple Hypertrophy* the enlargement is not great, and is not attended with any prominent symptoms. It has been chiefly observed in some cases of diabetes and leucocythæmia.

Treatment.—The treatment of these painless affections of the liver is unsatisfactory. In waxy liver the diet ought to be nutritious, with a moderate allowance of stimulants. The tincture of iodine may be given, in doses of fifteen minims diluted, thrice daily. Complications, such as diarrhoea, vomiting, etc., must be treated as they arise. In fatty liver, if dependent on indolent habits, an anti-saccharine or Banting dietary with exercise must be enforced. If due to alcohol, withdraw the stimulants. In both cases, alkalies with taraxacum are useful, or (F. 10); and if circumstances permit, the waters of Carlsbad, Marienbad, or Homburg can be strongly recommended. Iodide of potassium and common salt were at one time considered serviceable in *hydatids* of the liver, but subsequent experience has not

confirmed the hopes held forth, and it is now deemed advisable, if the tumour is increasing, to puncture and remove the liquid contents of the cyst by a fine trocar and canula. This being done, both the parent hydatids and offspring die. Out of forty-six cases reported by Dr. Murchison, thirty-five appear to have been perfectly successful. It is necessary only to withdraw a portion of the fluid to cause the death of the hydatid.

PAINFUL ENLARGEMENTS OF LIVER.

HEPATIC CONGESTION.—The phrase congestion of the liver is too often used vaguely and applied to cases of indigestion, when probably there is little amiss with the organ. In true congestion there is uniform though not very great enlargement of the organ—probably to the extent of an inch—which disappears after a time; the surface projecting below the ribs being perfectly smooth, tender on pressure, and accompanied by an uneasy feeling rather than acute pain, radiating from the liver up to the right shoulder. This feeling is increased to actual pain sometimes after meals, or when the patient lies on the left side. Jaundice, rarely intense, is present after two or three days, with nausea, loss of appetite, headache, scanty high-coloured urine, and other symptoms of indigestion. There may also be in acute cases evidences of obstructed circulation—splenic enlargement or ascites.

This congestion may be due to mechanical causes, *e.g.* consequent on disease of the mitral or tricuspid valve, or it may be dependent on errors of diet, excessive tipping, sedentary life, malarious or other poisons, or upon suppression of habitual discharges—the catamenia or bleeding from piles—or habitual constipation.

Treatment will vary with the cause, but in all cases of any severity hot poultices should be applied, with, in some instances, the application of leeches to the anus. The diet should be unirritating and non-alcoholic. *Purgatives of sulphate of soda or magnesia, aided by*

blue pill or podophyllin, should be given at first, followed by the mineral acids, with taraxacum and gentian. When wine requires to be taken, dry sherry and claret are to be preferred.

CATARH OF THE BILE DUCTS is associated with the same clinical characters as those of congestion, yet with more marked tenderness over the gall bladder, which sometimes can be felt as a pyriform tumour; while "obstruction of the common duct" has the further addition of jaundice.

CANCER OF LIVER, in fully three-fourths of the cases, is secondary to cancer in other organs, as the stomach, uterus, or female breast. It runs a rapid course, being rarely prolonged beyond twelve months. It is attended with great pain and nodulated enlargement, generally with jaundice and ascites, and with other evidences of malignant disease.

Treatment can only be palliative.

PYÆMIC AND TROPICAL ABSCESSSES differ in this, that the former are many in number and small, while the latter is usually single, and may attain a large size. The former are simply the evidence of the constitutional state termed pyæmia; while the latter, though rare in this country, may follow the acute hepatic inflammation of tropical climates. This inflammation has the symptoms detailed in congestion in an aggravated form, with the addition of high fever, and frequently troublesome hiccup. Should the inflammation end in the formation of an abscess, this will be signalised by chills and hectic fever, and by fluctuation more or less distinct, according to the distance of the abscess from the surface. The abscess, which is not generally very rapid in its progress, may burst into the peritoneal cavity, giving rise to fatal peritonitis, or open into the biliary ducts and be discharged by the duodenum. More frequently, however, when the matter gets near the surface of the gland, adhesive inflam-

mation is set up in the portion of the peritoneum immediately above it, and lymph is poured out which glues the organ to adjacent parts—to the abdominal parietes, the diaphragm, stomach, or some part of the intestine; the pus being then discharged externally, or into the lung, pleura, or stomach (Tanner).

Tropical abscess is often associated with, and considered by some the result of, dysentery.

Treatment is similar to that mentioned under congestion, in addition to the employment of chloride of ammonium and ipecacuanha in large doses. After suppuration has been established, the diet must be generous, and wine or brandy allowed. Operative interference seems advisable when there is a visible fluctuating tumour, when a distinct tumour projects from the normal contour of the liver, even should there be no fluctuation, and when constitutional symptoms indicate its presence, though there should be no local signs. It is inadvisable when, from jaundice or other symptoms, there is reason to fear the existence of numerous abscesses. The operation should be performed with antiseptic precautions, or, if the abscess is large, by means of Bowditch's syringe or Dieulafoy's aspirator.

CONTRACTIONS OF THE LIVER.

The area of hepatic dulness may be diminished instead of increased, and under the head of hepatic contraction we have—1, simple atrophy; 2, acute atrophy; 3, cirrhosis. In simple atrophy there is merely a diminution of the size and no alteration in the structure of the organ. The liver may be reduced to one half its normal weight and bulk. The circumstances under which it occurs are two, viz. old age and inanition, the latter being dependent on either an insufficient supply of food from actual want, or on a defective assimilation arising from other diseases, as cancer of the stomach.

In "*acute atrophy*" not merely is the liver rapidly

diminished in size, but the structure of the gland is altered. The secreting cells are broken up into granular matter and oil globules, and the whole organ is found after death to be soft and yellow. The disease is rare and caused by unknown conditions, though it is most common in pregnant females. It results almost invariably in death by coma, preceded by gastric catarrh, bilious vomiting, jaundice, and cerebral symptoms of a typhoid character, with low muttering delirium and albuminous urine.

Treatment is unsatisfactory, though temporary improvement sometimes follows smart purgation by sulphate and carbonate of magnesia.

CIRRHOSIS, the so-called gin-drinker's or hobnailed liver, derives its name from *κίρρος*, yellow, the colour being due to the large amount of yellow pigment found in the secreting cells. The liver becomes reduced in size in consequence of destruction of its secreting tissue, this destruction again being due to hypertrophy of the connective tissue. The organ is thus dense and preternaturally hard, its outer surface being granular and nodulated, and on section it presents firm fibrous bands, including the remains of vessels and bile ducts and surrounding islets of yellow secreting tissue.

The disease is chronic, usually extending over several years, and is insidious in commencement; at first there is probably increase in size, but latterly there is decided diminution in the bulk of the liver. In its early stages it is attended with symptoms of what may be termed alcoholic dyspepsia, sickness and retching in the morning, loathing for solid food, and a strong desire for stimulants, with some slight pain or tenderness over the hepatic region. In late stages, when the portal circulation has become obstructed, its hobnailed character may be felt externally—ascites appears and gradually increases, the spleen enlarges, and hæmorrhoids and hæmorrhages from the stomach and bowels occasionally occur. The disease is marked by progressive emaciation and debility, by a per-

sistent sallow complexion, though actual jaundice is rare, by increasing dyspeptic derangements; and results fatally, sometimes by exhaustion attended with coma or cedema and inflammation of the lungs. It is chiefly met with in adults between 35 and 60, in males more than females, and is almost invariably connected with a previous history of undiluted spirit-drinking on an empty stomach.

Treatment.—In the early stages the essential thing is to stop drinking habits. Spirits should be forbidden, although a little claret or hock may be allowed. The diet should consist of milk, eggs, plainly cooked white fish, game, and meat, with an avoidance of all hot spiced or greasy food. Regular exercise should be enjoined, and the action of the bowels facilitated by occasional saline or mineral water aperients, and the use of nitro-muriatic acid. In the second stage, though curative treatment is impossible, yet the same dietary must be enjoined. Purgatives and diuretics should be given for the ascites, and these failing, tapping must be had recourse to (F. 27, 35).

JAUNDICE.

The term jaundice is derived from the French *jaune*, yellow. Icterus, the Greek word for the golden thrush, another synonym, originated in the ancient idea that the sight of this bird by a jaundiced person was death to the bird but recovery to the patient. The affection has also been termed "*regius morbus*," from the royal and pleasant regimen prescribed for those who had it. Jaundice may be considered as a yellowness of the skin and conjunctivæ, and the tissues and secretions generally, from impregnation with bile pigment. It is not, as this and preceding remarks indicate, a disease *per se*, but a symptom accompanying many complaints, and its existence has given rise to much controversy and many conflicting statements. All cases of jaundice may be referred to two great causes—1st, when it results from obstruction to the common bile duct; 2d, when it is independent of

any obstruction. With regard to the first and most common origin there is not much dispute, as it is obviously then dependent on the bile which has been secreted being reabsorbed into the system. On the second point Frerichs's explanation, adopted by Dr. Murchison, seems to be the most feasible. It proceeds on the supposition that even in health bile to a greater or less extent is reabsorbed into the system in addition to what also passes away by the fæces, and is at once transformed; so that neither bile acids nor bile pigment can be discovered in the blood or in the urine, and consequently there is no jaundice. But in certain morbid states this transformation does not occur, and hence it circulates in the blood and stains the skin and other tissues, and jaundice is produced. These morbid states are the results of certain poisons, yellow fever, relapsing fever, snake bites, nervous influences, fear, rage, deficient supply of oxygen, or an excessive secretion of bile with great constipation. The obstructive causes, on the contrary, are from within, as gallstones,¹ foreign bodies from the intestines; or from without by pressure, as cancer of the liver or pancreas, loaded intestine, pregnant uterus, ovarian tumours, etc.

Symptoms.—The skin and conjunctivæ are of a yellow colour, the urine stains linen yellow, while on a few drops of nitric acid being added to it on a white plate, a play of colours, green, violet, pink, and yellow, is developed; the fæces are whitish or of a light clay appearance. The skin is often itchy, the temper irritable, the taste bitter, with a sleepy, drowsy sensation at all times. The function of digestion is uninterfered with, except in regard to fatty articles.

Cerebral derangements may supervene if jaundice continues long, with stupor and delirium and a tendency to hæmorrhages.

¹ Gallstones consist of thickened bile, which in some instances has formed round a nucleus of solid biliary matter. They may exist in great numbers.

Gallstones.—Gallstones result from the precipitation of certain substances held in solution in the bile—the precipitate, whether amorphous or crystalline, uniting to form larger or smaller concretions. They are formed chiefly in the gall-bladder, and their number is variable, usually from five to ten. Sometimes the number given is greatly exceeded, reaching to a hundred or several hundred, of the size of a pea. Practically, biliary calculi may be divided into “small stones,” from the size of a pea to a grain of sand; “medium-sized,” from the size of a pea to a hazel-nut; “large stones,” usually single, from the size of a walnut and over up to the dimensions of a moderately filled gall-bladder. Their shape is various, but in general they are round or egg-shaped, sometimes facets are observed on them, and their corners are usually rounded off. Their flat surfaces appear ground, and are either plane or slightly concave or convex. They are in colour usually brown, greenish, or yellowish brown. They are somewhat greasy to the touch, and in consistency slight, as they can easily be nicked with the finger nail. As their specific gravity is usually 1027 they cannot float in the bile, the specific gravity of which is from 1020 to 1026.

In structure they are occasionally simple, consisting of pure crystallised cholesterine, bile resin, or cholesterine and soap; or they may be compound and nucleated, with a shell surrounding this nucleus, and a crust or rind.

The chemical composition of compound biliary gallstones consists of substances found in the bile, or of the decomposition of substances found there, viz. cholesterine from 70 to 80 per cent, biliary colouring matter, biliary acids and their salts, fatty acids, and lime, especially in the form of the carbonate.

How do they originate? In decomposition and stagnation of the bile, by which certain substances, notably cholesterine, may so increase that the bile can no longer hold them in solution; or from acidity instead of alkalinity of the bile permitting it to precipitate; or from the

natural solvents hastening the same result by being present in insufficient quantity. Numerous conditions favour their formation. They are rare below the age of twenty-five, tolerably frequent after forty, and relatively to these ages most numerous in old age; and with regard to the sexes, they are seen in females more frequently than males, the proportion being 2:3. Sedentary habits predispose to them, and it is asserted their occurrence is sometimes hereditary; a faulty luxurious diet begetting corpulency, and an extreme interval between meals allowing the bile to be retained too long in the gall-bladder, undoubtedly act as conduces to their formation. And to these must be added tumours pressing on the biliary passages, inflammation or degeneration of the gall-bladder, or catarrh of the ducts, or any circumstance which tends to block up or compress the flow of bile.

How are they evacuated? Naturally through the excretory ducts of the liver or gall-bladder into the ductus communis choledochus, and thence into the intestinal canal, whence they usually escape per anum; occasionally they leave this natural path, and by ulceration and perforation reach various and often far distant parts of the body. Thus they may be found in the liver itself or hepatic duct; they may pass from the gall-bladder into the stomach or colon, or from the biliary passages into the duodenum. They may wander into the urinary passages, or the interior of the portal vein, or the cavity of the abdomen. When they have reached the intestine they may become impacted, and give rise to intestinal obstruction, and cause perforation of the intestines.

So long as gall-stones lie quietly in the gall-bladder they may give rise to no prominent symptoms, but the situation is altered when they are set in motion and advance through the excretory duct towards the intestine. Then their passage may give rise to what is termed "biliary" or "hepatic colic." With this colic there is *pain setting in sharply and suddenly, beginning at the epigastrium and radiating upwards towards the right*

shoulder blade. The pain occurs in paroxysms, and is described as being boring, burning, tearing, and women say that it is greater than even labour pangs. There is also vomiting at first of the food in the stomach, and of colourless acid fluid, if there is complete obstruction of the duct, or of bilious matter if this is removed. After from twelve to twenty-four hours of pain and vomiting if the obstruction remains, jaundice more or less pronounced results. The urine becomes of a dark brown mahogany colour, and the fæces are pale. Permanent closure of the duct is rare, and the jaundice does not last long,—a couple of days, or at most a couple of weeks. Severe attacks have been known to terminate in collapse and death, but this is rare, and the recurrence of the colic seems to depend on varying causes, and to follow on no well-assured intervals.

Treatment.—The object of treatment in gall-stones is obviously to moderate the pain and facilitate the passage of the stone. Hence, in severe cases morphia must be injected subcutaneously every hour or two hours until the pain is relieved, while hot poultices are applied to the hepatic region, or when these are not well borne, ice finely chopped and placed in a linen bag may be substituted. When the pain is less acute, a belladonna and chloroform liniment, without injections, may be trusted to. In an especially severe attack chloroform may be necessary, preceded by the application of a few leeches to the hypochondrium. Immediate relief is sometimes afforded by permitting the patient to drink large quantities of hot water, to which bicarbonate of soda has been added—in the proportion of one drachm to the pint. To relieve the vomiting, ice may be sucked and small quantities of champagne taken. Recently podophyllin has been recommended as a prophylactic in colic, and to prevent the re-formation of the stones. Many trust to calomel, scammony, and rhubarb, or sulphate of soda. If circumstances permit, the *alkaline* mineral waters of Carlsbad, Kissingen, and Vichy should be tried.

To dissolve stones already formed, sulphuric ether has long had a high reputation, and 20 to 30 drops may be given two or three times daily, mixed with the yolk of egg, and with the addition of 5 or 6 minims of ol. terebinth. This should be continued until there is no pain in the side, neither after eating nor exercise, and no yellowness about the eyes. As the acidity of the bile and abundance of the bile are probably causes of the return of the concretions, enjoin abstinence from substances which render the urine yellow and notably acid, *e.g.* salads, spirits, excess of animal food, spices or asparagus, while a moderate use of fruits, fowls boiled or roasted, and farinaceous food, may be recommended.

"In other cases of jaundice," says Dr. Tanner, "as we shall be merely working in the dark, it will be better to rest contented with resorting to gentle saline purgatives, diaphoretics, baths, rest, and regulated diet."

DISEASES OF THE PANCREAS.

Clinically we know little of the diseases of the pancreas, as the organ is rarely affected primarily. Lying deep in the epigastric region, behind the stomach, and in front of the aorta, it must be remembered that if a tumour exists in connection with it, it will be discovered in this region, and that pain will be referred either to the front or to the back at the junction of the lumbar and dorsal vertebrae. The principal diseases to which the pancreas appears liable are morbid growths (chiefly scirrhus); calculi (phosphate of lime) of varying size, obstructing the chief duct, and leading to enlargement of the organ and the formation of cysts; catarrhal inflammation of the same duct.

The symptoms of any of these affections during life are obscure, and attended with debility and malnutrition. As one of the principal functions of the pancreas is to

assist the digestion of fatty compounds in the food, the presence of fat in the stools has been detected in diseases of this organ.

Treatment.—All special treatment of affections so difficult to diagnose during life seems out of the question.

DISEASES OF THE SPLEEN.

The spleen, situated in the left hypochondrium, weighs about six ounces; its length being six inches, and its breadth rather more than three inches. Its external surface is convex; its internal border, which is concave, is in relation with the cardiac end of the stomach, and has a vertical fissure—the hilus—at which apertures are found for the entrance and exit of vessels and nerves. It has no excretory duct, and its exact purpose in the system is as yet undetermined.

Composed essentially of an elastic fibrous framework (trabecular tissue), of Malpighian corpuscles, and of spleen pulp, it may become distended with blood from slight causes, especially from those which interfere with the action of the skin, the liver, or the kidneys. These causes continuing, its elastic power may be lost, and it thus becomes unable to send the accumulated blood onward. It may thus suffer from congestion leading to inflammation, abscess, and gangrene. Emboli are apt to lodge in the spleen in the course of typhus fever or pyæmia, giving rise to what are termed “hæmorrhagic infarctions.” These infarctions are observed at post-mortem examinations as wedge-shaped masses, with the base towards the surface of the organ. Sometimes their previous existence may be detected by a depressed cicatrix, but in pyæmia they break down into a purulent fluid and give rise to general inflammation of the organ. The spleen also may, though rarely, be the seat of malignant disease, or serous and hydatid cysts may form within

it. If portal obstruction exists, enlargement of the spleen is a necessary consequence. In addition to the forms of disease mentioned, Leucocythæmia and Hodgkin's Disease are by some considered splenic diseases, and for convenience will be included under this heading.

The most common form of splenic enlargement, leading to hypertrophy of its tissue, follows the fevers of tropical climates, and is known as "ague cake." The history of the case, as associated with intermittent fever or ague, or residence in the tropics even without having contracted fever, and the marked increase in the size of the organ, form clues to diagnosis. In addition, there are signs of anæmia, debility, a sallow unhealthy complexion, and various digestive derangements. Tenderness on pressure is evinced, but this does not occur to any great extent unless the peritoneal covering is involved. In protracted cases general dropsy sets in, with a murmur following the first sound of the heart. Sometimes the spleen may be greatly enlarged without any marked disorder of the general health, with the exception of debility.

Treatment.—When the enlargement is the result of ague, change of climate and quinine are essential. In other cases steel and the bromide of potassium are serviceable. Arsenic is recommended in cases where there is no fever or periodicity. It can be conveniently given in the form of the iodide in $\frac{1}{2}$ gr. doses, accompanied or followed by iodide or bromide of potass, or both (F. 5).

LEUCOCYTHÆMIA.

Dr. Hughes Bennett of Edinburgh first directed attention to this affection in 1848, and six weeks afterwards Professor Virchow detailed another case where similar phenomena were observed in the blood. Dr. Bennett called the disease leukæmia or white blood, and imagined *it was due* "to suppuration of the blood without inflammation." He subsequently modified this view and called

the disease leucocythæmia (λευκος white, κυτος a cell, and αιμα blood), white-cell blood.

Pathology.—The pathology of the disease to a certain extent is expressed by the name, as there is a great increase of the white corpuscles of the blood, while the red ones are diminished. If an ounce of leucocythæmic blood, freed from fibrin, is placed in a glass, the red corpuscles sink to the bottom, while the colourless constitute the white milky upper stratum. Microscopically the excess mentioned is confirmed, and is more marked when the red corpuscles accumulate in rouleaux, leaving clear spaces filled with the colourless ones. The specific gravity is reduced. The disease is always associated with hypertrophy of one or more of the lymphatic glands, or of the spleen, or of both together. It is also sometimes associated with changes in the medulla of bone.

Symptoms.—Great pallor evidences leucocythæmia, and with the pallor there are weakness and emaciation, gradually increasing until death occurs. Ascites from the enlargement of the liver, spleen, or both, accompanies diarrhœa; epistaxis, urine loaded with uric acid, nausea, and jaundice, have also been noticed in cases which have come under observation. There may also be hæmorrhages from the bowels and urinary passages.

Treatment.—No remedy seems of any special avail in this disease. Of tonics, iron and quinine have appeared most serviceable (F. 77, 75). Good nourishing food should also be given. Diarrhœa and hæmorrhage should be treated as they arise, by appropriate remedies.

HODGKIN'S DISEASE.

The affection now to be considered has been termed "Hodgkin's disease," because that physician first drew attention to the morbid processes in question as a separate form of disease. In later times it has been called "malignant lymphoma," "lympho-sarcoma," "adenia," and "pseudo-leukæmia." The disease has been confounded

with leucocythæmia, previously described, but it differs from it in these essential facts in the clinical history, that there is no increase in the white corpuscles of the blood, and that its course is comparatively rapid, lasting only from two to six months or a year.

The disease generally begins with a moderately painless swelling of the lymphatic glands of the neck, of one or both sides, and this swelling gradually increases until regular chains of swollen glands are formed from the angle of the jaw to the clavicle. Later on, the inguinal and axillary glands are attacked, and finally the whole lymphatic apparatus, including the spleen. In a case which came under my observation last winter, the disease was accompanied, and in fact ushered in, by profuse bleedings from the nose, which occurred again at intervals. There was latterly intense dyspnoea, probably through the enlargement of the bronchial glands compressing the bronchi. There was excessive palpitation of the heart on sitting up, also an anæmic murmur, and gradually increasing pallor. Diarrhoea came on towards the end, and the temperature, which had been below the normal standard, rose during the last few days to 102° Fahr. The man finally sank into a comatose state, and died six months after admission to the hospital. Briefly stated, the nature of "Hodgkin's disease" may be said to be this:—There is hyperplasia, increased cell-growth of the lymphatic glands. This increased cell-growth may be soft, and exude a milk-white juice on section, or it may be hard and dry, of a yellow colour, and almost fibrous in appearance. As the "soft" and "hard" forms are sometimes found on the same body, it has been inferred that the latter is only an advanced stage of the former.

Treatment.—A series of cases lately recorded by Billroth indicates that the administration of arsenic in gradually increasing doses was attended with beneficial results. Previous to this, the disease had been considered *hopeless*.

BRONCHOCELE, GOITRE,

consists essentially in hypertrophy of the normal constituents of the thyroid gland, viz. the blood-vessels, the connective tissue, and the groups of intercommunicating vesicles. Sometimes these are all increased in proportion; the enlargement is, however, generally at the expense of the connective tissue and the vessels. The size varies from mere fulness to that of a cocoa-nut.

It is peculiar to certain localities, and constitutes the goitre of the Swiss and the Derbyshire neck of England. It is also found in Nottinghamshire, Sussex, Yorkshire, and seems in all cases to depend on the water supply being greatly impregnated with the sulphate and carbonate of lime, with the addition also, according to Virchow, of some endemic malarial influence not dependent on any of the causes mentioned. The enlargement is characterised by no pain. It is simply inconvenient by its bulk, which, however, may be attended with serious symptoms if there is pressure on the large veins, sympathetic, pneumogastric, or recurrent laryngeal nerves, or if the œsophagus or trachea is compressed. A peculiar enlargement of the thyroid body, occurring chiefly in young women, and associated with palpitation of the heart, uterine and menstrual derangements, and prominence of the eyeballs (exophthalmos), is termed Graves's or Basedow's disease.

This disease is rare in advanced life, and its origin sometimes dates from mental shock or some acute affection. Some deem it due to cardiac palpitation, others attribute its primary cause to goitre, but probably the best explanation is that it is connected with some affection of the sympathetic system, allowing passive dilatation of the vessels of the neck and thyroid body, implicating the blood supply of the orbit, and permitting an excited action of the heart. In fatal cases morbid conditions of the cervical sympathetic have been recorded.

The symptoms may be either gradual or sudden in their onset. In the latter case cardiac palpitation supervenes quickly, with distressing pulsation of the arteries of the neck, and then, after a variable period, changes in the eyes and thyroid body are observed. If gradual, the eyes may be first noticed as more prominent, glistening, and staring, this prominence becoming more pronounced, generally in both, but sometimes only in one eye, until the lids cannot be closed over them. The protrusion also is variable, being most marked during the menstrual period and times of excitement. The sight, moreover, is not much affected, and there is little danger of inflammation in the eye or eyes though so little protected. Following on the prominence of the eye comes the gradual increase of the thyroid body, attended generally with a thrill and a more or less distinct arterial or venous murmur, and great nervous irritability.

Graves's disease is not usually fatal to life, for it may remain stationary, or actual recovery may ensue; or it may be slowly progressive, and the patient may be cut off by some affection of the lungs.

Treatment.—In the endemic form the patient should be removed to another situation, and iodine and its preparations externally and internally should be given. Tincture of digitalis is useful for the excessive palpitation, in the exophthalmic form; or belladonna combined with iron.

In obstinate cases operative measures, as passing a seton through, or even extirpation of the gland, have been recommended.

DISEASE OF THE SUPRA-RENAL CAPSULES, ADDISON'S DISEASE.

The function of the supra-renal capsules is a subject of great interest and obscurity. Their purpose in the *economy of nature* is as yet undetermined. They seem, *like the spleen*, the thymus and the thyroid glands, to

be essential in a healthy state to the proper elaboration of the blood, and when diseased they lead, according to the investigations of the late Dr. Addison, to a peculiar series of phenomena. The conviction seems to have grown on Dr. Addison, that the supra-renal capsules were implicated, by observing that a peculiar form of anæmia with discoloration of the skin was not connected with disease of other organs usually associated with anæmia. The symptoms observed by him were great and increasing debility, a feeble pulse, faintness on the slightest exertion, loss of appetite, a pain in the epigastrium, shooting through also between the scapulæ, and progressive emaciation. With these general symptoms the skin became gradually discoloured; this discoloration being most marked in the face, neck, superior extremities, penis, scrotum, and round the navel. The skin in the regions mentioned, and also in the hands, assumed a dingy, smoky hue, which in advanced cases deepened into a "bronzed" colour. So marked was this in one case recorded by Dr. Addison, "that, but for the features, the patient might have been mistaken for a mulatto."

Cases of Addison's disease progress to an unfavourable termination in the course of one or two years on an average. The disease is most frequently observed in the active period of adult life and in those employed in manual labour. Dr. Wilks says the morbid changes in the capsules are, "first, the deposition of a translucent softish homogeneous substance; subsequently the degeneration of this into a yellowish-white opaque matter; and afterwards a softening into a so-called abscess, or drying up into a chalky mass." In other cases the solar plexus of nerves is found matted and thickened. The "bronzing" of the skin increases with the general debility.

Treatment.—No treatment seems of any avail. Cod-liver oil may, however, be tried as recommended by Dr. McCall Anderson.

DISEASES OF THE KIDNEYS.

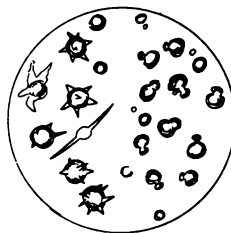
The quantity of urine passed in twenty-four hours in health is two pints and a half, or from forty to fifty ounces; in colour it is pale yellow, in reaction acid. Its acidity is determined by blue litmus paper, which it colours red. After exposure to the air for some days healthy urine becomes alkaline. This change is by some termed alkaline fermentation, and it is favoured by a high temperature. Whence the change? By the decomposition of the urea of the urine and its conversion into carbonate of ammonia, probably by the bacteria and fungus germs suspended in the air dropping on it. Such alkaline urine renders red litmus paper blue, and has the pungent smell of ammonia, and gives a white vapour of chloride of ammonium on holding over it a glass rod dipped in hydrochloric acid.

In certain conditions of the system the urine is neutral or alkaline when tested immediately after being voided. The acid reaction seems to depend somewhat on the acid gastric juice, and when this is neutralised by the carbonates of lime or magnesia, or diminished by frequent vomiting as in certain diseases of the stomach, the urine is alkaline. For a similar reason, when the juice is expended on the digestion of the food, urine passed a few hours after a meal is neutral or feebly alkaline. It is alkaline also when loaded with pus; if only moderately loaded, feebly-acid urine, which is alkaline when passed, is invariably opaque and tinted from precipitation of the phosphates. The specific gravity is from 1020 to 1025, and is determined by an instrument termed the urinometer. What is meant by specific gravity is at once seen by placing the urinometer in distilled water, and afterwards in healthy urine. It will be observed in the one case that the instrument floats at zero, while in the other at the figures mentioned before. The

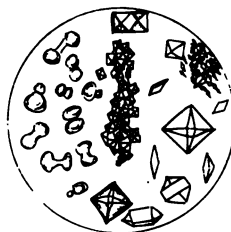
CRYSTALLINE AND AMORPHOUS URINARY DEPOSITS.



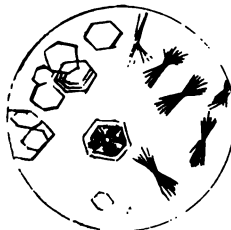
CHOLESTERINE
AMORPHOUS URATES



URATES OF SODA
URATES OF AMMONIA



OXALATES OF LIME



CYSTINE
TYROSINE



URIC ACID



URIC ACID



TRIPLE PHOSPHATES



TRIPLE PHOSPHATES

taking of the specific gravity is an important and essential step in determining the nature of the diseases of the kidney; for if below the figures mentioned, there is probably albumen, if above, possibly sugar.

Healthy urine freshly passed and examined with the microscope is absolutely structureless; allowed to stand for twelve hours a slight cloudy precipitate may be observed, which, on microscopic examination, reveals a few epithelial scales from the bladder, amorphous urates, or a few crystals of triple phosphate. The appearances presented by these deposits of epithelial scales, amorphous urates, and triple phosphates, are delineated in the engravings.

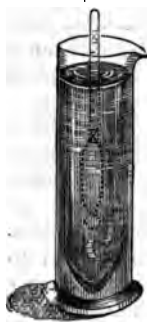


Fig. 14.

The amorphous urates consist of salts of potash, soda, and ammonia, in varying proportions. The triple phosphate is a combination of phosphate of ammonia and magnesia.

Sometimes these deposits are present in what may be termed detectable excess, and it is necessary to ascertain the effect of reagents upon them, which may be summarised thus:—

Urine containing a superabundance of urates has a very acid reaction, and a pinkish-red deposit which heat at once dissolves, leaving the urine clear. Urine containing phosphates has an alkaline reaction and a white deposit, which heat does not dissolve, but on the contrary makes the urine examined cloudy; this cloudiness disappearing on the addition of a drop of nitric acid.

The other crystalline deposits observed in urine are uric acid and oxalate of lime. The appearances presented by the former vary (see engravings), but they may be remembered by the fact that they are always coloured either red or orange-yellow.

Oxalate of lime crystals present an octahedral form (see

engravings), sometimes of various sizes, but rarely a dumb-bell appearance. Heat has no effect upon either of these deposits, but liq. potassæ dissolves uric acid, not the oxalates, which require a mineral acid. All these deposits indicate no structural kidney disease, but it is different when what are termed tube-casts are observed under the microscope. Of these there are five distinct kinds; 1st, blood-casts, or exudative; 2d, desquamative, or epithelial; 3d, granular; 4th, fatty; 5th, waxy or hyaline casts.

1. Exudative casts.

These consist of the coagulated exudation of fibrin, and present a mould of the uriniferous tubes. The fibrin is poured into the tubes as the result of inflammation; hence these casts are only seen in acute diseases of the kidney.

2. Desquamative or epithelial casts consist of a cylinder of coagulable matter studded over with epithelial cells.

3. Granular casts are usually small, and consist of the usual cylinder studded with small masses of fat, epithelium, oxalates, etc., giving a granular appearance, and being characteristic of the most chronic forms of Bright's disease.

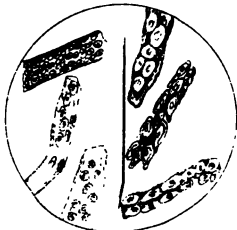
4. Fatty casts are the same as the preceding in their origin, only the cells have undergone fatty transformation, and the casts have the appearance of being studded over with oil globules.

5. Waxy casts are clear glassy cylinders presenting the appearance of a structureless substance.

It must be remembered that these three last forms of tube-casts are significant of chronic disease of the kidney, and may be seen in varying proportions on the same microscope slide.

Unhealthy urine may also contain pus and blood, detected by their respective appearances under the microscope. Urine containing pus also becomes, on the addition of liq. potass., thick, sticky, ropy, which is evident on attempting to pour it from one vessel to another;

RENAL TUBULE CASTS. - TUB AND BLOOD CELL TUBULES.



BLOOD CASTS
EPITHELIAL CASTS



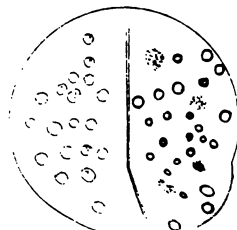
HYALINE CASTS



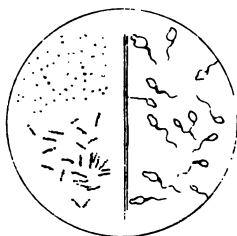
GRANULAR CASTS



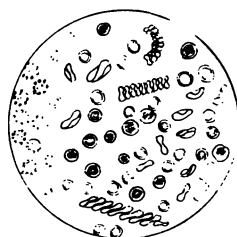
WAXY CASTS
FATTY CASTS



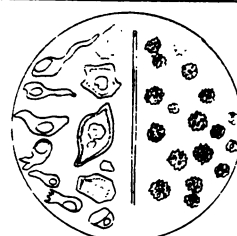
BLOOD GLOBULES
WAXY GLOBULES



VIBRIOS BACTERIA
SPERMATOZOA



BLOOD CORPUSCLES



EPITHELIAL SCALES
PUUS CORPUSCLES

JTW



while urine having blood in any but the smallest quantity has a smoky or red appearance, and coagulates on being heated. Bile can be detected in the urine by placing a few drops of strong nitric acid and urine on different parts of a white plate, and then allowing the one to run into the other. If bile is present, when the fluids meet there will be observed a play of colours—brown, green, blue, violet, red, and yellow.

The most important abnormal constituent in the urine is albumen, and it is essential that the tests for its presence there should be familiarly and practically known. For this purpose there are two great tests, heat and nitric acid. A test-tube should be filled to the depth of about an inch with the suspected urine, and heat applied by means of a spirit lamp to its upper stratum until it boils, when, if albumen be present, it becomes turbid and cloudy in various degrees. This cloudiness persists after the addition of nitric acid, and is thus distinguished from the phosphatic cloudiness which is also occasioned by heat, but disappears on the addition of the acid. It is important also to remember, that, if the urine is alkaline, heat will not affect the albumen and make it coagulate until a few drops of acetic acid have been added. The preliminary test for the acidity of the urine is essential, and also the addition of nitric acid after boiling, to distinguish between phosphatic and albuminic cloudiness.

Nitric acid alone is also an excellent test for albumen. A test-tube being filled as before, and inclined, a little nitric acid is poured in so as to trickle slowly down the side to the bottom. If albumen is present three strata will be observed—one perfectly colourless of nitric acid at the bottom, another above this, coagulated albumen, and at the top the unaltered urine.

Albumen having been detected in the urine leads to the inquiry, What significance has it, and with what diseases is it associated? The answer to this is—

Acute and chronic Bright's disease of the kidneys,

although it may also be found accompanying pregnancy, any of the febrile diseases, heart or lung affections, or cirrhosis of liver.

NEPHRITIS.

Previous to entering on Bright's disease, it is necessary to mention that the kidney, like other organs of the body, may be the seat of congestion, which may terminate at that stage, or go on to inflammation, and constitute what is termed nephritis. Nephritis is, however, rare. Congestion may be the result of exposure to cold, of overdoses of special drugs, such as cantharides or turpentine, or it may appear during the various febrile and inflammatory diseases. It may be then considered active congestion; while if it results in consequence of cardiac or pulmonary disease interfering with the general venous circulation, or from pregnancy, or tumours pressing on the renal veins or inferior vena cava above, then it is considered a passive congestion. Following from some of the above causes, or from the direct irritation of a renal calculus or embolus, or from inflammation of the bladder creeping along the ureter to the pelvis, infundibula, and calyces, the condition termed *pyelitis*, or inflammation of the lining membrane of the kidney, may be excited. The mucous membrane thus becomes congested, thickened, softened, and from its free surface is discharged mucus containing epithelium, pus corpuscles, and sometimes blood. If this affection is persistent, suppuration may be established, and even ulceration take place, not merely in the mucous membrane, but also in the substance of the kidney. This may be designated "suppurative nephritis." Supposing that the pus can escape easily by the ureter, and that one kidney is alone affected, the mischief may continue for years with little except local uneasiness, and it may ultimately become quiescent. In other cases, *and whether or not the ureter is obstructed, an abscess may form, enlarging and burrowing in all directions,*

sometimes penetrating the diaphragm, pointing in the loins, bursting into the peritoneum, or descending along the psoas muscle and pointing under Poupart's ligament.

Symptoms.—Pain and tenderness in the loins, increased by pressure or movement, irritability of the bladder, with the passage of urine clouded from the presence of blood, mucus, or albumen, characterise active congestion of the kidneys,—these phenomena being preceded by sickness, feverishness, and thirst. These symptoms are intensified in pyelitis, and pus is also present in the urine; while, if suppurative nephritis is established, the local pain will be greatly increased, and rigors and hectic fever will accompany, with, in most cases, a typhoid condition, suppression of the urine, and death by exhaustion.

Treatment.—In active congestion, if of independent origin, it is advisable to leech or cup the loins, and to follow this up by fomentations or the hot bath. The bowels should be kept freely open by a hydragogue cathartic, such as pulv. jalapæ co., if the urine is slight in quantity. If the pain is great, opium may in some cases be given. The treatment of pyelitis or suppurative nephritis is based very much on ascertaining the cause, and endeavouring to support the strength.

In chronic cases, astringents and mineral acids may be given (F. 78).

BRIGHT'S DISEASES.

The kidney has a thin translucent lightly-adhering capsule, and beneath this capsule is the kidney proper, containing a complicated and convoluted series of tubes lined with epithelium; and lying between the tubes, supporting and binding them, is a thin delicate web of fibrous tissue, and an abundant supply of blood-vessels to enable it to perform its secreting function. Each and all of these various parts may be affected with disease, but, as can be conceived from the intimate union existing *between them*, one cannot be affected without the other

sympathising, whatever may be the original starting-point. Diseases implicating the tubes, fibrous tissue, and blood-vessels, thus merge into one another.

The name Bright's disease is deservedly given in honour of the illustrious physician of Guy's Hospital, who, in 1827, threw the ægis of his name round all kidney affections associated with albumen in the urine. Bright's disease may be considered to be either acute or chronic.

ACUTE BRIGHT'S DISEASE,

under which term may be comprehended acute desquamative nephritis (Johnson), acute tubal nephritis (Dickinson).

The kidney is always enlarged, sometimes to twice its natural size, its capsule easily stripped off, its colour in the earlier stage deep red, and the section dripping with blood; in the later stage it is mottled red and white, and under the microscope there is observed an immense increase of the epithelial cells of the convoluted tubes, which are thus choked up to a greater or less extent, and compress the renal capillaries, while the intertubular stroma is unaffected. From this condition it may pass on to recovery, or remain what will be afterwards described as the large white kidney; or the disease may terminate in death by dropsy and other intercurrent affections, as pneumonia, pleurisy, and pericarditis.

Causes and Symptoms.—It may be the direct result of cold or intemperance, or occur during convalescence from scarlet fever or other blood-poisons. Fever, pain in the loins, marked diminution of urine—which is albuminous, smoky coloured, or dark brown from the admixture of blood, contains epithelial and blood-casts, and is of high specific gravity from decrease of water and increase of solid constituents—characterise the early stages of this affection. Dropsy supervenes. If a favourable termination ensues, the urine becomes more abundant, the skin moist, blood, albumen, and tube-casts disappear, and convalescence and recovery are established in a varying

interval of weeks or months. A large proportion—Frerichs says two-thirds—recover.

Treatment is based on obvious principles to induce perspiration and to relieve the overloaded tubes. Hence a warm blanket bath may be employed, the blanket being wrung out of warm water and wrapped round the patient, while an abundance of water should be drunk, and a mixture of acetate of potass, citrate of potash, and infusion of digitalis, ordered (F. 37). The bowels should also be freely acted on by jalap or elaterium (F. 27). A hot-air extemporised bath may be obtained in a private house by seating the patient on a wooden stool beneath which two or three lighted spirit-lamps are placed. Blankets should now be wrapped round the patient, and the head alone exposed. Perspiration is thus induced. A hot bath may also be employed for a similar purpose, the patient being placed in this, with the water at a temperature of 100° Fahr., which should be gradually raised to 107° Fahr. Here he should recline as long as he feels comfortable, not beyond a full hour, and then be packed in previously-warmed blankets for two hours. He is then finally to be rubbed down quickly and placed in a warm bed.

A less efficient but not to be despised method is simple packing in wet cloths, which should be relied on solely if the temperature is very high, for the baths previously mentioned have been suspected of hastening dreaded uræmic convulsions.

Locally dry-cup the loins and apply hot linseed-meal poultices. The diet should consist of milk, beef-tea, or nourishing soups. During convalescence all exposure to cold should be avoided, the wearing of flannel insisted on, and a mild preparation of iron, by preference the ammonio-citrate, given (F. 90). Change of air is also beneficial.

CHRONIC BRIGHT'S DISEASE.

Three chief types are recognised as post-mortem appearances of those dying of chronic Bright's Disease :

A.—Kidney smooth, white, and enlarged, as resulting from previous disease. The cortical substance is increased, capsule easily stripped off, while on the white or mottled surface “conspicuous stellate patches of blood-vessels are seen.” Microscopically the epithelial lining of the tubes is swollen, the tubes distended, and the cells opaque and granular, and often loaded with oily particles. The intertubular stroma is unaltered.

B.—Kidney granular, brown or brownish red, small and contracted. The capsule is adherent, requiring force to peel it off; the fibrous stroma is increased, and cysts are frequently developed, most probably through obstruction to the uriniferous tubes. Microscopic examination shows that the decrease of the size of the kidney is attained by extensive wasting of the glandular structure proper, the renal tubes with their epithelium, and the vessels attached to them. The granules upon the surface of the kidney appear as remains of renal tubuli still beset with epithelium, which epithelium is sometimes here and there in a state of fatty degeneration, although more usually perfectly normal. In the straight tubes of the pyramids nothing abnormal is detected. Sometimes the degeneration is not complete but partial, the sound portion being perfectly smooth, with the capsule easily detached, while the diseased part is granular and knobby, and the capsule is firmly adherent. Dr. Bright's original description of this kidney is as follows:—“The kidney is rough and hard and gives resistance to the knife in attempting to cut into it. Numerous projections are seen to rise on the surface, not much exceeding a pin's head. The tubular portions appear to be drawn near to the surface. It appears to be, in short, like a contraction of every part of the organ, with less interstitial deposit than in the last variety.”

Further, he indicates his belief that this second variety is but a modification of the first, an advanced stage of one and the same disease—an opinion entertained by most German pathologists, but not yet accepted by some English authorities.

C.—Waxy or lardaceous kidney, amyloid degeneration.

In well-marked cases the kidney is enlarged and smooth, and on section the cortex is bloodless, of a white or yellowish colour, with a waxy smooth appearance like bacon rind or white beeswax. In other cases the organ may be small. The degeneration seems to affect first the Malpighian bodies and small arteries, and to be followed by transudation of fibrin into the tubules, with subsequently, in some cases, atrophy. The proper test for this degeneration is iodine, which imparts, when applied, a deep mahogany brown colour to the parts affected, while it merely stains yellow the portions unimplicated.

The clinical history, course, and symptoms of these three forms vary.

THE LARGE WHITE KIDNEY,

following on the acute form or having a latent undetected origin, is attended with dropsy, the countenance being puffy and pasty. The urine is scanty, containing casts—epithelial, fatty, or hyaline; and the specific gravity normal or rather high, with albumen always present.

The average age of the patient is twenty-eight years. Recoveries and relapses are frequent. In fatal cases the ordinary duration of the disease is under six months, and in exceptional cases it may extend over some years.

THE GRANULAR CONTRACTING KIDNEY

is associated with middle age, not youth, being most common about fifty years, and more frequently observed in males than females in the proportion of two to one. Its commencement is insidious, the early symptoms slight, the progress slow, and the disease may run a latent course for months or years. The first evidence of the disease may be frequent and severe headache, or simply hemi-crania, or loss of strength, or vertigo, palpitation, and difficult breathing. Any one of these symptoms occurring *in a person of middle age* is suspicious, and may attract

attention to the kidneys. In others frequent micturition and some slight puffiness of the ankles lead to an examination of the urine, which is found to be copious in quantity (three to four pints), of low sp. gr. and with a comparatively small quantity of albumen. The tube-casts are few, and, if present, are chiefly hyaline or granular, with but little epithelium or fat. In later stages the urine becomes scanty and the albumen more abundant. The general health gives way, the pallor becomes pronounced, chest and stomach derangements increase, and death ensues through exhaustion, or with symptoms of œdema of the lungs, uræmia, or other intercurrent affection. As harbingers of speedy decease may be mentioned obstinate vomiting and diarrhoea, with itching of the skin and drowsiness. How the chronic nature of the disease gives rise to increase in the heart's structure is as yet an undetermined question; still in nearly fifty per cent of the cases there is hypertrophy of the left ventricle, and also a peculiar form of retinitis. The most consistent explanation of the hypertrophy is given by Traube, who attributes it to increased tension in the arterial system, this tension of necessity taking place as soon as a great number of arterial branches in the kidneys, with the Malpighian tufts attached to them, become obliterated, thus reducing the channels through which the blood of the renal artery can drain away. The hypertrophy of the left ventricle he regards as being for some time a necessary and efficient compensation for the loss of renal secreting tissue, and so long as the hypertrophied heart labours energetically no uræmic symptoms occur, for an over-abundant secretion of urine is being carried on. To the high arterial pressure on the vascular tufts is also attributed the albuminuria.

Gull and Sutton go farther than this, and state that there is fibrous thickening of the coats of the small vessels through the whole arterial system, and thus deny the *claim* which the kidney has as the special factor of the *ventricular* hypertrophy. They state that this general

arterio-capillary fibrosis leads to thickening of their walls, with loss of elasticity and subsequent wasting of the tissues, and so gives rise to the hypertrophy in question. Tube-casts are few in number, being either hyaline or finely granular.

THE WAXY KIDNEY

is associated usually with amyloid disease of other organs, as liver or spleen, and with a previous history of syphilis, caries, phthisis, long-continued suppuration, or other exhausting conditions. It is characterised by a large flow of urine, 100 to 200 ounces being passed in a day. The urine has a low sp. gr., with few tube-casts, generally hyaline in character. The albumen is at first slight, but as the disease advances, the urine, as in the previous form described, becomes of higher sp. gr., and the albumen more abundant. Dropsy does not, until the late stages have been reached, form a prominent feature of the disease. The disease may not be recognised at first, and hence may extend over a series of years. Indeed, it seems to form a part of various constitutional states, and upon these its ultimate issue depends.

Treatment of the various forms of chronic Bright's disease requires careful management, though based on certain obvious principles, hygienic, dietetic, and medicinal.

All exposure to cold should be avoided, and, if circumstances permit, a residence selected in a mild and sheltered spot, or, what is still better in the more chronic forms, a sea voyage should be made. The patient should be habitually clothed in flannel, moderate exercise insisted on, and the occasional use of warm baths and frictions to the skin.

Milk agrees well, and may be taken *ad libitum*. All spirits should be forbidden, but two or three glasses of claret or beer are permissible daily.

The constant draining away from the blood of one of its most important constituents necessitates the adminis-

tration of strengthening medicines, and experience has shown iron to be the best of these. The tincture often causes headache, and hence the citrate of iron and quinine, or the syrups of the phosphate or iodide of iron, are recommended, and should be steadily persevered in (F. 76). Dialysed iron in 5-drop doses four or five times daily seems to suit well, and causes no indigestion or blackening of the teeth. No medicine yet discovered seems to have any effect in diminishing directly the quantity of albumen, and hence other treatment must be symptomatic. Dropsy is the chief symptom, and the most effectual way to combat the dropsical effusions is by means of hydragogue cathartics and warm baths; the patient entering the bath at a temperature of 98°, which is gradually raised to 108°, and remaining in it for half an hour, when he returns to bed and is enveloped in blankets. Compound jalap powder and bitartrate of potash may be ordered twice or thrice a week, or Friedrichshall or Hunyadi Janos water. More active means of the same nature are found in gamboge and elaterium (F. 27). Subcutaneous injections of one-fourth of a grain of nitrate or hydrochlorate of pilocarpin produce copious diaphoresis, and are not attended with any risk. They may be employed daily in the forenoons two hours after breakfast. Latterly, to combat the increased connective tissue growth of the granular kidney, Bartels recommends the iodide of potassium, 20 to 30 grains to be given daily for a considerable length of time. Further, he advises the drug to be taken on an empty stomach, as it will then be conveyed in a more concentrated and active form to the kidneys.

Opinions vary greatly as to the value of diuretics, but Christison recommends digitalis and Rayer horse-radish tea.

In extreme dropsy punctures or incisions may be made into the skin of the legs or scrotum. Dr. Southey's *drainage tubes*, consisting of a perforated needle, which is inserted subcutaneously into the swollen legs, and to which gutta-percha tubing is attached and placed in a

vessel below the bed, can be specially recommended as safe and useful. The needle should enter the skin after having pierced a small piece of boracic lint placed on the surface. All chance of erysipelas is thus avoided.

Mercury, in any of its forms, is contra-indicated by most authorities. It rapidly produces salivation and most untoward consequences.

URÆMIA.

In the course of Bright's disease, or any other state attended with albumen in the urine, a group of phenomena termed uræmic is sometimes presented, owing, it is supposed, to a poisoned state of the blood. Generally they begin insidiously with headache and dimness of vision, followed by convulsive paroxysms, profound insensibility, stertorous breathing, pale face, and dilated pupils. In exceptional cases consciousness is not wholly lost, and the patient can be roused from the deep drowsiness by being spoken to or shaken. In these cases there may be some chance of recovery, but in others, when the coma is complete, a fatal issue is almost certain.

Much controversy and many theories have been excited by uræmia. The original idea of Willis was that the special poison in the blood was urea. Frerichs supposed that urea is harmless, and that its conversion into carbonate of ammonia occasioned the uræmic phenomena. The more recent experiments of Oppler and Zalesky indicate that neither of these theories is correct, but that the chief poisonous agents are the accumulation in the blood of the first products of tissue-change—creatinine, creatinine, and other extractives—which are converted in the kidneys into urea and uric acid. The question is as yet not satisfactorily determined; for, though the phenomena observed during life are plain enough, yet the absence of anatomical changes in the chief nervous centres must render the explanation of these a matter of theory and uncertainty.

Treatment.—When an uræmic attack has actually begun our resources are but limited, especially in anæmic patients, and consist chiefly of anæsthetics, and for this purpose inhalation of chloroform may be tried, or better still, chloral injections. In a very marked case last year in my wards, the subcutaneous injection of digitalin and the withdrawal of the ascitic fluid by tapping were alone and successfully trusted to. The quantity of chloral in the injection should be 45 grains to an adult, or 15 to a child, and it may be repeated if desirable. Should the attack be sudden, and the blood not greatly impoverished, as sometimes happens in pregnant women, free venesection has much to recommend it, and should not be dismissed as absurd simply because it was the panacea of our forefathers. In all of the forms of Bright's disease I have, by means of the ureameter,¹ carefully noted the quantity of urea excreted daily, and when this notably diminishes I suspect the probability of an uræmic attack, and endeavour to ward it off by drastic cathartics and copious perspiration. Benzoic acid, on the supposition that ammonia is the cause of the convulsions, has likewise been recommended in seven-grain doses every three hours. The poisonous alkali, it is thus fancied, may be converted into a harmless acid and salt.

A word or two here may be fitly added with regard to puerperal convulsions. These may be divided into three great classes—

1. The convulsions which commence before labour begins.
2. Those which come on during labour.
3. Those which succeed delivery.

In the first series several observers state that chloral arrests the convulsions. In the second the administration of chloral has been attended with excellent results. At the same time labour should be finished as soon as possible by the forceps or otherwise. In the third one dose of the same drug may terminate the convulsions. How

¹ See Appendix, p. 335.

or in what doses are you to give it? In 60 grains if you wish strong action, and follow this up by 15 grains if it seems to lose its effect. It should not, however, be pushed beyond 120 grains in the two hours. Some have recommended giving it in a pessary by the vagina. The efficacy of this is doubtful. If the patient cannot swallow, it must be administered by an injection.

CHYLOUS URINE

was first recognised and described by Dr. Prout, and has since been investigated by other observers. The urine is milky when voided; then coagulates into a tremulous mass like blanchmange; then liquefies into a creamy scum with a brownish sediment. The urine, in fact, presents those characteristics which would result from the admixture of normal urine and normal chyle. It contains fibrin, albumen, fat in a molecular form like the fat of chyle, and occasionally a small proportion of red corpuscles. *No casts* have, however, been detected; and the fat chiefly characterises the urine passed after meals.

Chylous urine is more common in tropical than temperate climates, in adults than in children, in females than in males. Its presence is not inconsistent with good health. Intermissions are frequent. After lasting some time, it may disappear for years, or even for life.

Pathology.—Dr. Prout imagined it to be due to a faulty assimilation, by which the chyle was permitted to mingle with the blood; and combined with this was some renal disorder, by which the kidneys permitted the chyle to transude and mingle with the urine. The blood examined, however, presents no signs of chyle, and post-mortem examination reveals no disease of the kidneys. Dr. Roberts says it is due to vesicular dilatation, and rupture of portion of the lymphatic vessels situated on the mucous surface of the bladder or urinary tract.

Treatment.—Numerous remedies have been suggested, and have failed in doing good, as can easily be imagined.

if Dr. Roberts's explanation is the correct one. Rest and local astringents are advisable, with tonics to combat the anæmia (F. 78).

HÆMATURIA,

as its name implies, means the admixture of blood with the urine; and this mixture is easily recognised by the colour it imparts to the secretion, unless the quantity is very small, when it may require the aid of the microscope to detect it. Blood or blood pigment can be detected by Heller's test. This consists in adding caustic soda solution to urine in a test-tube, and boiling. The earthy phosphates precipitate and entangle the hæmatin, which is thus carried to the bottom of the tube as a sediment of a brick-dust or bright red colour. The guaiacum test consists in placing a few drops of urine in a test-tube, adding one drop of tincture of guaiac, and shaking up with a few drops of ozonic ether. The ether dissolves the precipitated resin, or goes to the surface and carries with it a distinct bluish colour if blood be present. This is due to the ozonising power of the blood, and this property is destroyed by adding to the urine containing blood a small quantity of quinine. Blood in the urine may originate from different sources, which, as a general rule, can be recognised from the following considerations. If from the kidneys it is found equally diffused, giving to the urine a smoky reddish tint, and after standing a while a grumous-coloured deposit subsides. If from some other part of the urinary tract—*e.g.* if it comes from the ureter, bladder, or urethra—the colour is more bloody, more red, perhaps affecting only the part of the urine which is latest voided in micturition, and frequently distinct clots are observed in the deposit. If the clots are large and readily distinguishable, and there is no history of an injury, we may safely infer that *the blood is not from the kidney or the renal vessels proper*; for in true hæmorrhage of the kidney the coagula

are formed within the renal tubes, and betoken their origin by the cylindrical cast and entangled blood-cells which they present. All urine containing blood is necessarily more or less albuminous.

By far the most common cause is congestion, due to some blow or injury in the renal region. It may also arise from acute Bright's disease, from malignant disease of the kidney or bladder, from the presence of a calculus either in kidney, ureter, or bladder; or from the taking of irritating medicines, as turpentine or cantharides. Sometimes it is symptomatic, and dependent on other than urinary diseases. Thus it is seen in purpura and scurvy; or it may be found in yellow fever, cholera, or any of the eruptive fevers; and when detected in the course of these diseases, the prognosis is most unfavourable. At other times it is supplementary to a normal state or diseased condition, *e.g.* it may accompany menstruation in a woman, or a hæmorrhoidal flux in either sex. The endemic hæmaturia of the Mauritius and Brazil is dependent on the presence of a small parasite which infests the mucous membrane of the pelvis of the kidney, or bladder.

Hæmorrhage from the bladder, due to acute cystitis, fungoid growth, or calculi, is usually recognised by symptoms referred to that organ, viz. very frequent micturition and pain in the hypogastrium. Urethral hæmorrhage is known by the escape of blood during the intervals of micturition.

Treatment will vary with the causes and circumstances of the hæmorrhage, but when our object is to treat the hæmaturia for itself—to stay the loss of blood—perfect rest is absolutely necessary, and the application of ice to the seat of the hæmorrhage. Thus if the kidneys are the seat, put ice poultices to the loins; if the bladder, to the epigastrium and perineum. With the local application of ice give astringents internally, *e.g.* acetate of lead gr. iii., pulv. opii gr. $\frac{1}{4}$, in a pill every two hours, until six or eight doses have been administered; or ergotin may be injected subcutaneously.

In severe vesical hæmorrhage a solution of alum, 20 grains to the pint of water, may be injected into the bladder.

HÆMATINURIA

is a curious disorder, to which attention was first drawn by Dr. George Harley in 1865. The peculiar feature of the disease is the paroxysmal passing of dark-coloured urine, containing not blood, but merely the colouring matter of the blood—hæmatin. A sense of shivering or cold about the loins precedes the paroxysm. The intervals between these are irregular, and there is no certainty about their occurrence; for sometimes the urine at one micturition is clear, at another like porter and bloody-coloured. Microscopically, the urine presents chiefly an immense mass of amorphous granular matter, with dark granular-coloured tube-casts. The prognosis is favourable, though the duration of the disease cannot be defined.

Treatment.—During the cold stage send the patient to bed, and administer warm stimulating drinks. Tonics, as iron and quinine, are also indicated (F. 76).

GRAVEL, RENAL CALCULUS, OR COLIC.

Sometimes concretions of crystalline or amorphous sediments form in the pelvis of the kidney, and are accompanied with severe pain in their passage along the ureter to the bladder. There is also a frequent desire to micturate, retraction of the testicle, nausea, and vomiting, intense relief being obtained whenever the substance reaches the bladder. This may be termed a “fit of the gravel.” When there is merely gritty matter or sand, no pain whatever may be experienced. The most common forms of gravel are the urates of ammonia, uric acid, the triple phosphates of ammonia and magnesia, or oxalates of lime.

Treatment varies with the nature of the deposit.
▲ *Vichy* or *Carlsbad* waters and alkalies are useful when

the urates predominate. If phosphates, the nitro-muriatic acid and a generous diet. If oxalates, dilute the urine by drinking plenty of cold water, which must not contain much lime, and avoid all saccharine substances.

During the passage of a calculus employ a warm bath, afterwards poultices or fomentations to the loins, also give barley-water to drink, along with spiritus ætheris nit. and vin. ipecac. To relieve the pain give morphia subcutaneously; sometimes chloroform is necessary (F. 39, 40).

In addition to the diseases mentioned, it may also be stated in general terms that the kidney or kidneys may be attacked by cancer, either primary or secondary, usually of the encephaloid form, and that the leading symptoms of the former are a tumour in the abdomen, sometimes very large, and hæmaturia; that tubercle or hydatids may also originate in the organ, exhibiting in neither case very well-defined symptoms, though resulting fatally in both; that when any impediment exists to the flow of urine from the kidney, dropsy of the kidney, or hydronephrosis, may ensue, through dilatation of the pelvis, with atrophy of the cones or whole substance of the organ; and that, finally, one or both kidneys may be shifted from their original position, occasioning the condition known as movable kidneys. To enter, however, further into details would be foreign to the object of this handbook.

DIABETES.

The word *diabetes*, derived from the two Greek words, *δια βαίω*, literally means that the water is constantly running through the patient's system. Used literally, diabetes may thus have a wide significance, but it is now employed as representing two distinct kinds of disease. In both there is an increased flow of urine; but in the one, Diabetes Mellitus, there is sugar in the urine, in the other, Diabetes Insipidus, this is absent.

Diabetes insipidus seems to depend on unknown causes,

attacking by preference the male sex, usually between the ages of five and thirty. It has certain permanent and characteristic features, viz. an excessive flow of uncoloured urine of low sp. gr., containing neither sugar nor albumen, and attended with a dry skin and great thirst. Its course is uncertain, and its treatment empirical.

Diabetes Mellitus, although it seems to have been known in some measure to the ancient physicians, was practically unrecognised until Dr. Willis, in 1674, described it as a distinct disease; "for in it the urine differed from all other fluids of the body, as if it had been mixed with honey or sugar, and having a powerfully sweet taste." Passing over subsequent years, it may be mentioned that Dr. M'Gregor of Glasgow in 1837 discovered sugar in the blood as well as the urine, and that the stomach formed saccharine matter instead of healthy chyle, which entered into the blood, and instead of forming fat, bone, and muscle, was passed into the system as sugar, and thence eliminated by the kidney. Claude Bernard in 1848 opened up a new era in diabetes, when he pointed out how sugar was formed and excreted from the system. He found the blood of the hepatic vein to be rich in sugar, whilst the blood of the portal vein contained no sugar whatever, or mere traces of it; and he further discovered sugar in the livers of animals fed entirely on meat. He concluded therefore that as the blood entering the liver contained no sugar, while that leaving it had it in abundance, sugar was formed in the liver under normal conditions. He subsequently discovered within the liver itself a substance closely resembling sugar in the arrangement of its elements, and readily changed into sugar under the influence of an animal ferment. This substance was glycogen, and around it he perceived centred the formation of sugar in the liver. For the transformation of glycogen into sugar was the result of a ferment of the liver, and so the hepatic veins carried the sugar-loaded blood to the inferior vena cava, whence it reached the heart, and where

again it was transferred in the usual circulatory course to the lungs to be burnt up and consumed. If this oxidation was complete, sugar was not detected in the blood or in the urine; but if it was incomplete, sugar was observed in both, and the existence of diabetes mellitus could be recognised in the latter by its appropriate tests. Further, he showed that by puncturing or irritating the eighth pair of nerves at their origin in the fourth ventricle, an abnormal development of sugar could be produced; and this pre-eminently favoured the idea that the whole process of sugar-formation in the liver was governed by the nervous system. Such is a brief outline of Bernard's theory, and it has formed the point of departure for many theories of diabetes since broached.

This glycogenic function of the liver, the foundation of his theory, has been assailed notably by Pavy. He found sugar in the blood of all parts of the vascular system, in the hepatic veins, and in the tissue of the liver itself if immediately removed from the living animal and examined without loss of time. He found the sugar constantly increasing up to a certain limit from the beginning of death. It was thus a post-mortem process. He considers that the hydrocarbons taken with the food are normally stored up in the liver in the form of glycogen, and this is not changed into sugar but into fat, which serves for the formation of bile. Under abnormal conditions glycogen is converted into sugar, and thus diabetes is produced.

Other theories have been advanced, but they may be said, generally speaking, to be modifications or enlargements of the views of Bernard or Pavy. And these two theories again merge into the wider question, Does diabetes proceed primarily from the nervous system, or has it its origin in the intestinal canal or the liver? Is it neurogenic or hepatogenic? A dogmatic answer can scarcely be given. In all probability the great majority of cases of diabetes have a nervous origin, but others *proceeding primarily from the digestive organs must be*

allowed. To enter into further details would provoke unnecessary digression in view of the plain fact that there are no constant post-mortem appearances in diabetes mellitus. The brain, the spinal cord, and the different internal organs have been searched, but in vain, for its cause. The liver and the kidneys, seemingly so much implicated, reveal nothing inconsistent with health. In a careful examination of nine cases in the Glasgow Royal Infirmary, Dr. Foulis found no confirmation of Dr. Dickinson's statement that there was a dilatation of the arteries of the brain followed by degeneration and excavation of the nervous substance in the neighbourhood.

The symptoms of diabetes are as patent as its pathology is obscure, for it may be suspected if there is thirst and an increased quantity of urine, with loss of weight, impaired physical and mental endurance, and disinclination for all sexual intercourse. The skin is dry, the tongue is hard, red, and cracked, the digestion is faulty, and the bowels constipated. Wandering and severe pains are frequently complained of in the muscles of the calf of the leg, and these pains sometimes prevent sleep. The temperature is low, there is a lack of interest in passing events, and a melancholy hopelessness as to the future.

The urine passed may rise to 15, 20, 30 pints, or more, in the course of twenty-four hours, and it presents to the eye a pale colour, while its odour is sweet, like that of new-mown hay or that detected in a chamber containing apples. There is no sediment after standing, and this and the clear colour suggested to Dr. Prout the pertinent inquiry for fixing the date of the beginning of the disease by asking the diabetic patient "When did you last observe your urine muddy?" The effect of sugar is to increase the specific gravity, which in all cases of persistent glycosuria is above 1020, and in some instances it rises to 1050. Is the existence of sugar in the urine in all cases indicative of diabetes? The answer to this is, Not *always*, for it may be found in certain other circumstances;

as in cerebral injuries, tumours of the brain, meningitis, some liver affections, after inhalation of chloroform or poisoning by corrosive sublimate, or after eating saccharine ingredients in large quantities. In these cases it is temporary; in diabetes it is constant, although it may sometimes disappear should acute inflammation or fever supervene. How is sugar detected in the urine? By the following distinctive tests:—

Moore's Test.—Add half the volume of liq. potass. to the urine. Boil in a test-tube, when the mixture assumes a dark brown colour. Healthy urine is only slightly darkened by the same proceeding.

Trommer's Test.—Place some of the urine in a test-tube, add a drop or two of solution of sulphate of copper, when a pale blue tint is produced. Add to this liq. potass. in a proportion equal to half the volume of urine, when a pale blue precipitate of the hydrated oxide of copper is thrown down. Boil, and the result will be—

1st, The dissolving of the first precipitate;

2d, The throwing down of a yellowish-brown precipitate of sub-oxide of copper.

If there is no sugar there will be merely a black precipitate of common oxide of copper.

Fehling's Solution.—A more delicate test consists in what is termed Fehling's solution, consisting of sulphate of copper, tartrate of potash, and caustic soda (F. 92). Boil a small quantity of the solution, then add a few drops of the urine, when, if sugar is abundant, the same yellowish-brown precipitate as in the former case will result. If equal quantities of urine and of the test are used, and no change ensues, then there is not $\frac{1}{10}$ of a grain of sugar present.

How is the quantity of sugar excreted estimated? The most convenient way is by the differential density method of Roberts. Collect the total quantity of urine passed in the twenty-four hours. Place some German yeast with a sample of the urine in a bottle, and then cork and invert it on a saucer also containing some of the urine, and put

it at the side of the fire or in a temperature of 80° Fahr. Fermentation ensues. The sugar is decomposed into alcohol and carbonic acid. The acid is liberated, and collects in bubbles at the top of the bottle, which should be wide-necked and afford sufficient space for its doing so. The loss of sugar occasions a loss of density, and the difference is equal to the amount of sugar per ounce.

Thus,—Fermented specimen = 1010
 Unfermented specimen = 1040
 Loss = 30 = 30 grs. of sugar per ounce.

For the exact volumetric estimation of the sugar excreted, the following method may be taken. A sample of the total urine of twenty-four hours is taken and diluted with nine parts of water; place this diluted solution in a burette, and note the point at which it stands. Place a measured quantity of Fehling's solution, equal to a given weight of sugar, in a flask, and dilute it to 3 oza. or 100 c.c., boil, and add drop by drop the diluted urine from the burette. When all trace of blue colour has disappeared from the fluid in the flask, the quantity of dilute urine added is noted, and from this amount the total weight of sugar excreted may be calculated. It is necessary to stop occasionally to remove the flask from the flame to allow the cuprous oxide to subside in order to see if there be any blue colour remaining; a yellow tint in the fluid indicates that an excess has been added. Suppose the formula for Fehling's solution given in the appendix be used, and 200 grs. of the solution be taken for an experiment, and suppose 100 gr. measures of the diluted urine were necessary to remove the copper from solution, then 100 grs.

100 grs. = 10 grs. urine
 10 grs. urine = 1 gr. sugar
 1 oz. or 480 grs. urine = 48 grs. sugar.

Thus it is seen that each ounce contains 48 grs. of sugar, and this amount multiplied by the number of ounces passed gives the total weight of sugar excreted.

The course of diabetes is chronic. It is free from fever,

and the morbid process may come to a standstill. The prognosis is more grave in young subjects than those after thirty, and statistics show that though its duration may extend over several years, yet three-fourths die in from six months to three years after its first detection; and how? By exhaustion, by œdema of extremities, phthisis, pneumonia, bronchitis, carbuncles, abscess, gangrene, or through inflammation of serous membranes of an asthenic type. More commonly still, death takes place in a few days with coma. This coma is not uræmic, for there is an uninterrupted flow of urine to the last, with no marked twitching of the muscles, and the temperature is much lower than normal. It seems a kind of poisoning, and is probably due to the acetone developed in the blood, for acetone given in large doses to animals produces similar results. Hence the term *acetonæmia* applied to it.

Cataract, which is associated with advanced cases of diabetes, comes on suddenly, and out of two hundred and twenty-five collected cases was detected twenty times. It attacks both eyes, and seems due to the direct action of the sugar influencing the nutrition of the crystalline lens. Weakness of sight and double vision are frequently observed in diabetics.

Treatment.—The great principle in the dietetic treatment of diabetes is to vary the diet, and to stick to no hard-and-fast rule. Vegetables are injurious, but all vegetables are not equally so, for experience has shown that green vegetables, cabbage, spinach, and cauliflower, can be taken without injury. Sugar will produce sugar, but substances sweet in themselves and nearly allied to sugar fail to increase saccharine urine. There is a craving for sweets, and we find that animal fats and glycerine satisfy this to a great extent. Diabetic bread is dry, and diabetic tea is insipid; hence soften the former with butter and sweeten the latter with glycerine. Flesh meat, fowls, and fish form important elements in the daily fare. Cheese may be given, and also eggs, especially *the white*. The patient may drink moderately of seltzer

water, and to this may be added daily four to six ounces of brandy and whisky to aid digestion. Ordinary milk contains about 4 per cent of sugar, yet it is found that neither milk nor cream notably increases the quantity of sugar, and to many a milk diet is very grateful; all sweet wines—champagne, port, or sherry—should be avoided, yet red wines can be taken. Eschew also, as far as possible, highly farinaceous articles—bread, potatoes, rice, and sago. A pleasant form of bread suitable for diabetics is prepared by Walker, Glasgow, and can be highly recommended. Medicinal treatment has failed as yet to arrest the sugar formed in diabetes, though many drugs have been tried, including lactic acid, carbolic acid, creasote, tincture of iodine, arsenic, iodide of potassium, and the various preparations of opium. Of the latter, codeia in half-grain doses upward seems certainly to have the effect of reducing the quantity of urine, but it does so at the expense of the appetite, for the patient will be found to become weaker and lose weight by its continuance. Without entering into details, I may state that I have found the following treatment to fulfil the two chief indications required, viz. relief of thirst and consequent diminution of urine; increase of weight and subsequent restored mental and bodily vigour.

1. $\frac{1}{4}$ of a grain of nitrate or hydrochlorate of pilocarpine is placed on the tongue thrice daily. This causes increased salivation and what a Scotch diabetic terms "sappiness" of the mouth.

2. 5 grains of pepsine and 20 of dilute hydrochloric acid are taken after every meal for three weeks.

3. This is followed by a mixture of phosphates as (F. 91a), which is continued for months.

4. If there is not a natural action of the bowels daily, an enema is always insisted on.

5. If the patient can afford it, a yearly visit should be paid to Carlsbad or Vichy, for it is found that patients using these waters void little sugar, and can take vegetable diet with impunity.

DISEASES OF THE NERVOUS SYSTEM.

We shall now attempt a brief description of diseases of the brain, and afterwards proceed to take up other affections connected with the nervous system. Insanity will not be spoken of except incidentally, as the subject is too special and complicated to be dealt with in a handbook such as this. The student must remember that our investigations of diseases connected with the nervous system are necessarily obscure during life, and that this obscurity is often not removed by post-mortem revelations. These so often clash, that any accurate classification seems at present dubious. The following synopsis of diseases of the brain may be found serviceable :—

1. Cerebral anæmia, from discharges of blood, and also from poor living.

2. Cerebral congestion, active or passive, as in diseases which obstruct the circulation, as tricuspid insufficiency, etc.

3. Embolism and thrombosis, occluding the vessels at a point beyond the circle of Willis. The area supplied by the occluded vessels is at first pale, and then tinged, from the back flow of blood into it leading to red softening, and the subsequent degenerations of the tissue in the area.

4. Diseases in which the vessels burst, and which result in bleeding; *e.g.* fatty degeneration of the walls of the vessels, miliary or larger aneurisms; diseased states of the blood, as purpura, etc.

5. Inflammation of the membranes. Meningitis may be—1. Simple acute; 2. Simple chronic; 3. Tubercular.

6. Inflammation of the brain substance, or encephalitis, or local inflammation, often followed by abscess.

7. Tumours, especially syphilitic.

8. Gray degeneration of the nerve tissue of the brain and spinal cord, with increase of the interstitial tissue in areas here and there.

9. Dropsy of the brain and membranes, hydrocephalus, *etc.*

CEREBRAL ANÆMIA.

In cases of death from cerebral anæmia, a pale colour of the brain is observed, most marked in the gray substance, but also making the white matter look more pale than normal. There is also an absence of the usual red points, combined with a diminished quantity of blood in the vessels.

Symptoms.—Giddiness, ringing and buzzing in the ear, paleness of the face, faintness and loss of consciousness, characterise the lighter forms of cerebral anæmia, as in the faintness which attacks the student on his first sight of an operation. The graver forms may be due to sudden hæmorrhage, and may be attended with convulsions and coma. The state of the pupils is first contraction, next dilatation, and, finally, the normal condition if the issue is to be favourable. By many authorities, death from sudden shock is considered as due to cerebral anæmia.

CEREBRAL CONGESTION

may be either active or passive, and certain appearances, which may, however, be all or in part absent, are observed on post-mortem examination. In the active form the capillaries and large blood-vessels of the brain and pia mater are increased in size; hence the blood points are observed to be larger and more numerous than usual, while the pia mater has a red or rose-coloured appearance, in spots, or throughout its whole extent. The gray matter is red or violet in hue, the choroid plexuses are enlarged, and the ventricles contain an excessive amount of fluid. In the passive form, when the quantity of venous blood is augmented, the veins generally are distended.

Symptoms.—In the active form there is pain, dizziness, and confusion of the intellect, which may last from half an hour to two or three days; sleeplessness, irritability of temper, and inability to do any mental work, with a sense

of flying heat shooting over the head and neck, and redness of the face, are also prominent symptoms. In the passive form there is the same confusion of ideas, but with mental torpor instead of irritability, and drowsiness instead of sleeplessness. In the very severe forms there may be loss of consciousness, or delirium, or convulsions. The slight forms are rarely dangerous in themselves, and may be recovered from under treatment. In the severe forms the prognosis is grave, and when death occurs it is during coma.

Treatment.—General blood-letting, once so common in cerebral congestion, is now abandoned, except in cases attended with delirium. Local leeching behind the ears is in some cases advisable. The object of treatment is to draw blood away from the head, hence quickly-acting purgatives, such as croton oil, or calomel and jalap, are employed; while, at the same time, mustard and vinegar should be rubbed on the legs and arms, or the feet may be placed in a warm bath. In the lighter cases ice should be applied to the head. The diet should be light, and all alcoholic stimulants forbidden. Bromide of potassium and ergot are recommended by Hammond, followed by strychnia (F. 71a).

In cerebral anæmia a horizontal position is indicated, with nourishing soups and wine, and the avoidance of all mental disturbance. Tonics containing quinine and iron are also useful.

CEREBRAL EMBOLISM AND THROMBOSIS.

If the occlusion, the shutting up of a vessel in the cerebral circulation, is due to a something being carried away from a distant part of the system and lodged at the point of occlusion, we say it is due to embolism. If, on the other hand, a clot is formed locally at the spot occluded, we consider it is the result of thrombosis. The result in either case will be the same to the substance of the brain unless the obstruction be removed. It must lead to deficient supply of nourishment in that particular place, to softening, and to the loss of functional power in

the parts thus deprived of their nutriment. The symptoms which, however, characterise the first step of the occlusion—the wedging-in—vary somewhat. In embolism the onset is sudden; there are no premonitory warnings, but rapid giddiness, or an involuntary cry, or immediate loss of consciousness. In thrombosis the symptoms are slowly developed, preceded by pains in the head, general confusion, loss of memory, perhaps numbness, and these show the occlusion is complete, that the vessel is fairly dammed up. The further symptoms between the two must be the same, being dependent on the same circumstances. Hemiplegia may follow, or the paralysis may only affect the tongue, or there may be simply a loss of the faculty of speech. Further, it may be mentioned that thrombosis is usually associated with advanced age and feebleness of the heart's action; while in embolism there is valvular disease of the heart, which, of course, may occur at any age.

CEREBRAL HÆMORRHAGE.

Cerebral Hæmorrhage, by which is meant extravasation of blood in the substance of the brain, depends essentially, according to recent authorities, on miliary aneurisms, which appear as little globular masses in the small intracranial vessels, and are due to a diffuse arteritis proceeding from without inwards. Although this statement may in the main be true, yet hæmorrhage may also arise from softening of the cerebral tissue, from atrophy of the brain substance, and from tension of the blood-vessels, the result of mental and physical causes. In the majority of cases the seat of cerebral hæmorrhage is the corpora striata, the optic thalami, the crura cerebri, and the medulla oblongata, on the right side more frequently than the left. The blood poured forth, varying according to the causes, dislodges part of the brain substance and lies in the cavity thus produced. If death does not occur, the further behaviour of the extravasated blood is the absorption of

the serum, the contraction and degeneration of the red corpuscles and the fibrin, the contraction of the cavity, and eventually the formation of a cicatrix which encloses the remains of the clot.

Symptoms.—Often previous to the attack a group of symptoms may forewarn the patient, as sudden difficulty of speech, defects of vision, dizziness, faintness, sickness. There may, however, be none of these prodromata, the patient being struck down abruptly, as if shot, and rendered thoroughly unconscious, with loss of sensibility and power of motion; the breathing stertorous, lips and cheeks puffed out with expiration, the pupils largely dilated and insensible to light. After a time, if death does not occur, consciousness returns, the patient attempts to turn in bed, and endeavours to speak. He finds, however, that articulation is indistinct, that the muscles of one side of the face are paralysed, and the power of motion of the limbs and body on the opposite side is lost.

The temperature is found at first to be low, 96.8° , next normal, 98.5° , so continuing if recovery is to be complete; but if a fatal result is to ensue, it will rise markedly to 104° or 106° .

There is another form of cerebral hæmorrhage unattended with unconsciousness, and in which the patient is sensible of his condition, but unable to avert the hemiplegia which ensues.

Causes.—A long list of exciting causes may be made out. It will suffice simply to mention drunkenness, excessive venery in old people, extreme joy or anger, and straining at stool. It is also found that winter is more favourable to the occurrence of cerebral hæmorrhage than summer, and that neither a thin nor plethoric frame, neither poverty nor riches, specially provoke it. The chief predisposing causes are diseases of the heart and vessels, and an occupation necessitating great exertion.

Prognosis.—In the severe seizures death may occur within a few hours, in the less severe about one third of those attacked die; while in the mild form the prognosis

is generally favourable, although the patient cannot be considered free from danger until after the eighth day.

Treatment.—If there are any forewarnings, the bowels should be opened by a brisk purgative, the head kept cool and well raised, every mental strain avoided, and the bromide of potassium given in thirty-grain doses.

During the attack, symptoms should be met as they arise. If the bowels have not been recently opened, place two drops of croton oil on the tongue; if the urine is not passed naturally, draw it off with a catheter; if hæmorrhage is still supposed to be going on, inject ergotin subcutaneously. The patient should also be kept quiet, with the head well raised, and in a well-ventilated room of an even temperature.

A great general rule may be stated not to give stimulants or apply electricity until the clot on the brain may be considered absorbed and a cicatrix formed. Hence not until the fourteenth day should remedial measures be put in force to restore the power of motion and prevent contraction. The agents best suited for this purpose are passive motion, strychnia, phosphorus, and electricity (F. 85).

APOPLEXY

is a term significant chiefly of a prominent symptom in the last three affections of the brain described—embolism, thrombosis, and cerebral hæmorrhage. It denotes a clinical fact, a stroke, a beating down suddenly; and as this was accompanied by loss of consciousness and motor power, with stertorous breathing and peculiar countenance, older writers attempted to establish and did name as a disease what is in truth only a symptom. They distinguish between several varieties, as sanguineous, nervous, and serous apoplexy. This nomenclature has now been abandoned, and the various clinical phenomena are classified under the term “an apoplectic attack.” The question may be asked, Is it possible to distinguish between the *causes* which may produce this? The answer to this

question is simply a matter of conjecture, but something may be learned from a careful examination of the state of the heart in certain cases, and from the inspection of the peripheral arteries.

A person may, however, be discovered in an unconscious state, resembling an apoplectic seizure, and it is of great importance that a diagnosis should, if possible, be clearly established, as serious mistakes may otherwise occur. This unconsciousness may be due to drunkenness, to uræmia, to narcotic poisoning, to epilepsy, or to concussion from a fall or blow. In all cases the history will form a marked determining distinction, and especially is this true in the two last; for if dependent on epilepsy, the attack will not be long, and there will be an account of former seizures; if from concussion, there may be injuries or bruises on other parts of the body, probably bleeding from the ears or nose, and other circumstances tending to the supposition that the insensibility is due to wilfulness or accident. In drunkenness the patient can be aroused to some extent, the insensibility not being complete; there is no hemiplegia, and the smell of the breath will betray alcohol; yet as drunkenness and an apoplectic seizure may exist together, the diagnosis should be guarded, and if a doubt exists, it is better to err on the safe side and act as if they were combined. In uræmia there is no hemiplegia; the urine, if drawn off by a catheter, will be found to be albuminous; and there will in all probability be indications of dropsy in other parts of the body.

In narcotic poisoning the pupils are contracted, with no hemiplegia, no remissions in the insensibility, but on the contrary deepening coma.

In all doubtful cases it is advisable to use the stomach-pump.

CEREBRAL SOFTENING.

Cerebral softening may be caused either by anæmia or inflammation, and is a result of some of the lesions already *described*, or it may proceed without any of them, as, for

instance, from long-continued intellectual exertion or mental emotion. It is most apt to occur between fifty and eighty. Cerebral softening, the result of anæmia and due to imperfect nutrition of the part affected, is designated *white, yellow, or non-inflammatory softening*, and seems to be dependent on the brain cells being turned into fat—the colour being due to the fat granules being mixed with the colouring matter of the blood. In advanced cases the softened brain matter is white and cream-like, and so soft that a weak stream of water washes it away. In the softening due to inflammation the broken-down nervous substance, with the albuminous exudation and blood corpuscles, causes the centre of the softening to present the appearance of a red pulpy mass, and hence the term *red or inflammatory softening*.

The symptoms vary according to the cause which produced them, but, generally speaking, are loss of intelligence and memory, affection of the speech, delusions, drowsiness, headache, and slowly advancing paralysis.

SCLEROSIS.

In contradistinction to softening of the brain, it is convenient here to consider an affection which of late years has attracted considerable attention. In order to understand what is meant, it is well to remember that in the nervous tissue of the brain or spinal cord there is, besides nerve cells and nerve fibres, another element present, which binds these together, and gives the whole substance its normal degree of consistence. This substance fulfils, to all intents, the purposes of connective tissue in other organs of the body, and has been termed neuroglia or nerve-cement. In sclerosis this tissue is increased or hypertrophied, the proper nervous substance being in consequence compressed and atrophied; the result is increased hardness and density over a greater or less extent of the nervous system. Hence different names are given. Thus, if it involves both the brain and spinal cord it is

called "multiple cerebro-spinal sclerosis," if brain alone, "multiple sclerosis"—the sclerotic or hardened parts in these two cases being diffused through the respective areas mentioned as plates or nodules of varying size, and to a certain extent circumscribed; while in a third form affecting the brain, and termed "diffuse sclerosis," there are no such boundary lines, the hardness affecting one lobe, or even a whole hemisphere. Without entering further into a subject which may be said to be still in its infancy, it may be useful for the student to recollect that diffuse sclerosis commences in infancy, and terminates always in imbecility, and often in idiocy; multiple cerebral sclerosis is a disease of male advanced life, with pain and trembling of individual or combined muscles, of arms or hands, or other parts, followed by paralysis, which ultimately extends to the trunk; in multiple cerebro-spinal sclerosis, paralysis is noticed before trembling, the latter being only evidenced when a voluntary movement is made.

These two latter affections were at one time described under their most prominent symptom, "paralysis agitans," particular attention being also drawn to the fact that the victims would run or plunge eagerly forward in a jog-trot style to any tangible object, while they were unable to walk slowly. This mode of progression is now termed "festination."

APHASIA.

By aphasia is meant not merely loss of voice or aphonia, proceeding from the larynx; not merely impairment of articulation, as in the outbreak of hemiplegia from paralysis of the muscles employed in speaking; but an impairment or loss of the intellectual, as distinguished from the mechanical, element of speech. It is an attack on that peculiar gift of man—articulate speech—the power by which he expresses his ideas, and clothes them in words.

Although it is most frequently a combination of loss of power of speech, loss or impairment of the power of

writing, and of gestures (pantomimic gestures), yet in its simplest form it appears to be a sudden rupture between the formation of the idea in the mind and the expression of it in words, without being necessarily accompanied by any loss of muscular power. Hence the division into—1, *Amnesic aphasia* (forgetting or confusing words); and, 2, *Ataxic aphasia* (defective action of the muscles of articulation—inability to form even those words which are remembered).

Etiology.—The cause of aphasia is obscure. It may occur during convalescence from fever, and is temporary, or from cerebral softening or hæmorrhage, and is then often permanent.

Symptoms.—The patient has plenty of words sometimes at his disposal, but not the right words. Speech is then conducted in a Malaprop fashion, or simply questions are answered in monosyllables, as by yes or no. The face is intelligent. Remembering faces and events, the patient is unable, either by writing or speaking, to find words to express ideas. Nouns are substituted for nouns, verbs for verbs, numerals for numerals, and proper names for proper names. Examples are given where patients forget their own names, or at least are unable to express them. Yet an aphasic patient may be able to play at cards correctly, and even to read, without, however, being able to recollect what has been read. Though attacks of temporary aphasia are recovered from perfectly, yet, if they are in any way permanent, the prognosis is very doubtful.

Pathology.—Aphasia is most commonly associated with hemiplegia of the right side, and M. Broca has attempted to prove that this is due to the fact that the power of language is situated in the posterior portion of the third left frontal convolution of the brain. This view has received some confirmation from post-mortem and clinical observation, as this portion of the brain may, through an embolus plugging up the middle cerebral artery, become imperfectly nourished, and consequently softened and degenerated. Ingenious theories have been

founded on this supposition, the most practical result being, if it is true, that on the right side the same part has also latent power of language, and that we should not despair but that this may, in the course of time, be evoked, and a moderately intelligent life be the result.

Treatment.—Rest, bodily and mental, is all we can do for an aphasic patient. All excitement should be avoided, the bowels attended to, and the digestion carefully regulated.

Blistering or drugging seems of little avail in aphasia with hemiplegia. Yet, if there is any syphilitic history, iodide of potassium should be given (F. 5).

ACUTE MENINGITIS.

By this is understood acute inflammation of two membranes of the brain—the pia mater and the arachnoid. It is generally the result of injuries to the head, exposure to great heat, spirit-drinking, mental anxiety, or retrocession of an exanthematous eruption.

Symptoms.—Headache, vomiting, and rigors usher in the disease, followed by fever, flushed face, and red eyes, contracted pupils, and intolerance of light or noise. Delirium of a furious character is an early and pretty constant symptom. The tongue is coated, and the bowels are confined. If the disease is to terminate fatally, muscular twitchings ensue, sometimes convulsions, and the delirium merges into coma and collapse.

Treatment.—Local blood-letting in the early stages, with an active cathartic, is useful (F. 23). The head should be shaved, ice applied to it, and light excluded from the room. Beef-tea may be given at regular intervals. Calomel is recommended by some to be given every two hours until salivation is produced. Should mercury not be decided on, the bromide of potass may be ordered in large doses, with or without the iodide. In cases where the patient cannot swallow, fluid nourishment may be administered by means of a tube passed through the nose.

TUBERCULAR MENINGITIS

is a disease not uncommon in children under five years. The ventricles are found distended with serum, with the convolutions much flattened, and this characteristic appearance in post-mortem examinations led to its being called "acute hydrocephalus," before it was understood that the essential causes of the disease were the tubercles and subsequent inflammation. Gray miliary tubercles are found at the base of the brain, along the course of the middle meningeal artery and its branches. These tubercles may be so minute as to defy detection unless aided by the microscope, or they may be so abundant as to form large granular masses, or blend into cheesy patches of considerable extent and thickness. They appear to originate in the walls of the small arteries of the brain, whose channels they invade and block up in parts, and hence intense hyperæmia is caused in collateral vessels, and the pia mater at the base of the brain is very vascular. The disease always terminates fatally.

Symptoms.—Tubercular meningitis is preceded by signs of failing health for some weeks or months before the attack sets in, which it does generally with obstinate vomiting and intense pain in the head. The child screams, the belly is drawn in, and there is great intolerance of light and sound. The temperature varies from 101° to 103°. This may be called "the stage of excitement," which lasts from seven to fourteen days, and is succeeded by "a stage of depression," with a strong tendency to sleep. The child lies quietly on its back, with its pupils dilated, and takes no notice of external objects. Occasionally there is a peculiar scream, called the "hydrocephalic cry." Respiration is irregular and sighing, pulse low, temperature subnormal, bowels constipated. This stage may last from two or three days to as many weeks, and is followed by a further "stage of paralysis," characterised by the temperature again rising above the normal,

by frequent and possibly violent convulsions, heavy dull eyes, paralysis and coma.

In accordance with the pathology of the disease advanced, it may, generally speaking, be stated that the "first stage of excitement" depends on the implication of the pia mater of the convexity and of the surface; "the second stage of depression" to the development of the hydrocephalic effusion; the "third stage of paralysis" to the gradual paralysis of the centres of the medulla oblongata. Convulsions, to a greater or less extent, may also be present during the whole course of the disease, and cannot be referred to any one stage. Tubercular meningitis in its later stages simulates no other disease, yet at first it may be mistaken for typhoid fever more readily than anything else.

Treatment.—The line of treatment is indicated under "Tuberculosis," and is simply prophylactic. When the disease has become established, it seems obvious, from the nature of it, that little improvement can be obtained, for the disease is incurable, as the tubercles can never be absorbed. Niemeyer advocates iodide of potass, and Hammond advises to refrain from all leeching and mercurial purgatives, as only tending to make existence more intolerable.

CHRONIC HYDROCEPHALUS can scarcely be mistaken for any other disease, as it consists essentially of an accumulation of fluid in the ventricles, or in and beneath the arachnoid. The head is in consequence altered in form, enlarged in size, the fontanelles open, the forehead prominent, and the face and body thin and wasted.

In many cases it is congenital, or the result of chronic inflammatory disease of the membranes, appearing generally about the sixth month, and lasting for a varying term of months or years, with a fatal termination either from exhaustion or coma.

Treatment.—Compression by means of adhesive plaster applied over the whole cranium seems serviceable; and

if that fails, puncturing and drawing off the fluid may be tried. Cases have been recorded where mercury was beneficial, followed by iron. Any tendency to this disease should be met by fresh air, regulated strengthening diet, and cod-liver oil. All attempts to exercise the brain should be discouraged.

ENCEPHALITIS is a local inflammation often followed by abscess. The part most frequently involved is the gray matter of the cerebrum or cerebellum, and the size of the affected part varies from that of a walnut to that of the closed fist. It is caused by injuries, or from extension of inflammation from the ear, and is said always to terminate in death.

The symptoms during life are increase and afterwards decrease of the sensibility, with headache, convulsions, paralysis, or coma.

TUMOURS OF BRAIN may be of various kinds, vascular, parasitic, cancerous, tubercular, or syphilitic, etc.

The growth of a tumour is at the expense of the brain, which in health nearly fills the cranial cavity; hence pain, usually fixed and severe, is in the majority of cases a prominent symptom, with disordered sight, hearing, and taste. Convulsions, local paralysis, and giddiness, are frequent concomitants. If the pain in the head is severe, fixed, and intense, and there is also a history of syphilis, there is every probability of the tumour being of syphilitic origin, and this is strengthened by finding nodes on the surface of the body.

PARALYSIS.

Paralysis or palsy denotes loss of motor power and sensibility in one or more parts of the body. The loss of motor power in the parts affected, the most striking characteristic, may vary from the slightest feebleness to the most complete inability to perform any movement. The former, the incomplete, is now often termed "paresis," while "paralysis" is reserved for the complete or nearly com-

plete. Paralysis may be general or partial, as the whole or only part of the body is affected, and various names indicate when the paralysis is only partial. Thus, when it is limited to one side, it is termed "hemiplegia;" if confined to the lower half of the body, "paraplegia;" if only affecting a small portion of the body, as face, foot, or leg, it is designated "local paralysis;" and if the nerve specially implicated in causing this is known, it can be fitly designated accordingly, *e.g.* "facial paralysis," "paralysis motor oculi." Again, paralysis may be due to certain occupations, hence the names "mercurial paralysis," "lead paralysis;" or, if associated with certain symptoms, it is known by these, hence "wasting paralysis," "paralysis agitans."

Before proceeding to describe the more prominent of the nervous diseases it is well to be familiar with characteristic gaits or walks in spinal affections, for from these a differential diagnosis may be made. There are three leading varieties.

1. The "paretic and paralytic gait," caused by a more or less extensive palsy of the lower extremities. The gait is shuffling, the tip of the foot drags on the ground, the sole is planted awkwardly, usually with the outer edge first. The patient walks with the aid of canes, or requires the support of crutches or attendants. He may be able to stand thus securely, but left alone he in most cases simply sinks to the ground.

2. The "atactic walk," due to disturbance of co-ordination in the legs. The movements are hurried and characteristic. The point of the foot does not drag. It is thrown forward and outward, and the heel is brought down with a decided stamp—the leg stiff at the knee. The patient's eyes are directed to his feet, and when fixed on these he may stand without inconvenience. But if his attention is directed to the ceiling he totters and falls, and the same thing occurs if, when walking, he is asked to turn round quickly.

3. The "stiff spastic walk," due to reflex muscular

contraction or tension associated with paresis of the legs. The legs are dragged. The feet seem to cleave to the ground, and the tips appear to find inequalities even on a level surface. Every step is accompanied with a hopping movement of the body, which is slightly bent forward. The tendency is to walk on tiptoe, and there is no throwing about of the feet. Generally speaking, the first variety is dependent on disease of the anterior columns of the cord, the second on the posterior, while the third involves the lateral. The first two are often seen; the latter is rare.

GENERAL PARALYSIS.—In the course of some forms of mental derangement a gradually advancing paralysis sooner or later involves nearly every muscle of the body, and hence it has been called "general paralysis." Paralysis of the lips and tongue leads to defective blurred articulation, and the invasion also of the facial muscles gives the face a sad or blank look. As the disease progresses to its almost invariably fatal termination, the physical powers diminish, and the patient, unable to walk, stand, or sit, is confined to bed for the rest of his existence; death occurring either from the difficult deglutition leading to choking, or from sheer exhaustion, or other intercurrent affection. Atrophy of the optic nerve can often be detected by the ophthalmoscope.

HEMIPLEGIA.—This is generally spoken of as a paralytic stroke; and though it may be associated with many of the affections previously mentioned, it is most commonly due to hæmorrhage into the brain substance. As the result of this or of some of the other cerebral diseases, the left side of the body is most commonly found paralysed, although the actual seat of the lesion in the brain is on the right side in the great majority of cases. The decussation of the pyramids accounts for this phenomenon. Owing to the affection of the facial nerve, the cheek hangs loosely, with the angle of the mouth slightly drawn upwards to the sound side; and the tip of the tongue, when protruded, by the implication of the hypoglossal, is pushed

to the sound side, owing to the counterbalancing power of the corresponding muscles being lost. The articulation is imperfect, and if the third nerve is also involved, the upper eyelid drops, the pupil is dilated, and there is a divergent squint. The loss of motion may be complete in the arm and leg, and the patient lies in bed helpless. If it is partial, or if the original attack is being recovered from, the gait is peculiar, the affected leg being drawn after the sound one in a shuffling way, with, if the patient is able to lift the foot so far, the toes pointed to the ground. In most cases there is loss of sensibility as well as motion.

Hemiplegia may be permanent, or it may tend to recovery, which commences in the leg.

Treatment.—Two weeks after the original seizure, but not sooner, it is by some recommended daily to use friction over the paralysed parts, with flexion and extension of the joints. Subsequently the subcutaneous injection of strychnia is recommended, or preparations of phosphorus (F. 85) may be taken internally. The most valuable agent is, however, the application of the constant galvanic current.

PARAPLEGIA has usually an insidious commencement; the feet and legs feeling weak, cold, or tingling. As the disease advances, the weakness increases, sensibility and power of motion are gone, and the patient is obliged to remain in a horizontal position, having lost also control over the bladder and rectum. Rest is frequently disturbed by involuntary movements of the limbs.

Paraplegia may be due to caries of the vertebræ, to concussion or compression, congestion, inflammation, or softening of the spinal cord or its membranes. It may also accompany other affections, as hysteria, pregnancy, worms, or urinary diseases. The history must be the chief guide to the diagnosis as to whether the paraplegia is primary or secondary, dependent on congestion or diminished nutrition.

Treatment.—If from the nature of the symptoms it is considered that congestion, or too much blood being sent to the cord, originates the paraplegia, it is desirable to administer the ergot of rye internally, and belladonna externally. Both these remedies contract the vessels of the cord and membranes. If, on the other hand, there are evidences of malnutrition or of reflex paraplegia, strychnia is to be preferred, combined, if there is much restlessness, with opium and a generous diet. In addition to this, if the paraplegia seems of reflex origin, the cause should, if possible, be removed. Thus worms must be expelled, the bladder relieved, and hysteria obviated.

FACIAL PARALYSIS, or BELL'S PARALYSIS, is an affection of the portio dura or facial portion of the seventh pair of nerves either at its origin or in its course, or as the result of pressure. The appearances are characteristic, as there is paralysis of motion, more or less complete, of the muscles supplied by the nerve. Hence the face has a blank unmeaning expression. The eye of the side affected cannot be closed, tears run over the cheek, the mouth cannot be pursed up to whistle, nor expanded to smile. In accordance with the anatomy of the facial nerve, it will be found that if the morbid process originates above the origin of the chorda tympani nerve, there will be a diminution of the sense of taste in the corresponding side of the tongue; if behind the gangliform enlargement of the petrosal nerves, there will be, in addition to the other symptoms, paralysis of the parts supplied by these—the uvula will be drawn to the sound side, and the palatine arch will fall down and become straight instead of curved.

By the tongue being unparalysed and deglutition unimpaired it is distinguished from glosso-labial paralysis, and by the fact that the patient cannot close the eye, from the facial paralysis of hemiplegia. Facial paralysis is often the result of cold, debility, or syphilis, and tends to recovery in from six to ten weeks. If dependent on

cerebral or intracranial lesion, the prospect of cure is remote.

Treatment.—The persistent use of electricity is of great importance, one pole of the induced current being placed over the point of exit of the nerve, while the other is applied in succession over the various muscles supplied by it. The healthy nutrition of the system should be secured by hygiene and tonics, especially strychnia. If there is reason to suspect a syphilitic taint, give potash and mercury (F. 1).

PARALYSIS OF THE THIRD NERVE, MOTOR OCULI.—The paralysis of this nerve depends upon tumours or exudations pressing on it, or cold, or reflex irritation, such as worms or indigestible food. The upper eyelid in consequence falls down, occasioning the condition termed ptosis; and, if of intracranial origin, the eyeball is turned outward and the pupil is dilated.

If due to cold and not dependent on cerebral causes, recovery is the rule.

GLOSSO-LABIO-PHARYNGEAL PARALYSIS.—The essential lesion here is found in the medulla oblongata and upper part of the spinal cord, and consists of atrophy of nerve cells connected with the origin of the hypoglossal, spinal accessory, and pneumogastric nerves. As a consequence there is a slow yet steady loss of power of the muscles of the tongue, soft palate, pharynx and larynx, and also of the orbicularis oris. The disease, dependent on unknown causes, invariably results in death from asphyxia or cessation of the heart's action through implication of the cells of the pneumogastric.

MERCURIAL PALSY or TREMOR is caused by long-continued exposure to the fumes of mercury, and is characterised by tremors and jerkings of the voluntary muscles, beginning in the arms, but extending sometimes to the legs, tongue, and jaws. These movements are increased by the mind being brought to bear upon them or by attempts at exertion.

Permanent bad health is often the result.

Treatment.—This consists in withdrawal from the cause to a fresh, pure atmosphere, and giving iodide of potassium.

LEAD PARALYSIS has been considered under "Colic," page 174.

WASTING PALSY, PROGRESSIVE MUSCULAR ATROPHY.

—In this peculiar disease, loss of strength in certain muscles of the body, particularly the shoulder, arms, and hands, first attracts the patient's attention, and this is followed by atrophy of the muscular tissue, not merely of the parts primarily affected, but progressing until every voluntary muscle of the body may be involved, with the exception of the muscles of the eyeball or the levator palpebræ superioris. The affection seems peculiar to males from twenty-five to thirty-five years, and in some instances to be hereditary. The cells of the anterior tract of gray matter of the spinal cord appear to be destroyed by a slow chronic inflammation; and the presumption is, since the disease is unaccompanied by paralysis, that the cells involved are not motor cells, but those which are supposed to govern the nutrition of muscles—trophic cells. The prognosis is very unfavourable, especially if the disease is hereditary.

Treatment.—This must be based on the steady employment of the continuous and interrupted currents, with tonics or iodide of potassium if there is any suspicion of syphilis.

WRITER'S CRAMP is a form of nervous disorder attacking those who are engaged in writing a great deal. It is first attended with fatigue and inability to hold the pen firmly, and ultimately, if it progresses, with spasmodic irregular movements of the fingers and thumb when any attempt at writing is made.

Half-measures are of little avail in writer's cramp, and complete abstinence from work is necessary to restore nervous vigour.

INFANTILE SPINAL PARALYSIS is generally ushered in with fever, convulsions, and pain in the back, marking the seat of the disease as being in the spinal cord. Then it is noticed that the child does not use one hand or kick with one leg ; or the paralysis observed may be restricted to a group of muscles, or embrace the four limbs. The temperature of the affected limbs is lower than the corresponding sound ones. This loss of power may last a month or six months, and is succeeded by atrophy, with loss of the electric contractility of the affected muscles, and in some cases even by arrest of development and degeneration of the bones. The essential lesion appears to be situated in the anterior horns of gray matter consisting of an inflammatory softening leading to degeneration and atrophy of the part affected.

Treatment.—This is local and general. The induced current should be applied directly to the skin over the paralysed muscles, and afterwards friction with a dry towel or flesh-brush should be practised several times in the course of a day. Ergot should also be given in ten-drop doses of the fluid extract thrice daily, and may be increased up to half a drachm. If the stage of atrophy is reached, ergot is useless, and strychnia must be administered (F. 80), with the persevering use of the induced current should the muscular contractility still continue. "If this is lost to the induced current, the cure will be difficult and the treatment protracted ; if the primary current is also powerless, a cure is impossible." (Hammond.)

NEURALGIA.

Under this head should be included affections which, so far as can be ascertained, are not due to diseases of the brain or spinal cord, but the seat of which is in the nerves themselves.

Different names are given, according to the site of the nerves affected. Thus we have facial neuralgia or *tic-douloureux*, *sciatica*, and *lumbago*.

FACIAL NEURALGIA is more apt to attack females than males during adult life, and seems often to have some connection with menstruation, lactation, mental excitement, or exposure to cold. The pain is frequently excruciating, coming on and disappearing at fixed hours of the day. It may attack the nerve at any or all of its divisions.

SCIATICA.—The pain is referred to the course of the sciatic nerve or its branches, and may be restricted to the gluteal region or upper part of the thigh, or it may extend to the soles of the feet. It generally lasts from two to three months, but is apt to recur. It is often associated with a lowered physical stamina, and sometimes there is a previous history of gout, rheumatism, or syphilis.

LUMBAGO and PLEURODYNIA.—The dorsal and intercostal nerves are here the seat of pain, which is continuous in character and much increased by exertion. The mere act of straightening the back in lumbago often causes great agony.

Treatment.—In facial neuralgia quinine and arsenic are efficacious, with the addition of colchicum if there is a history of gout, or liquor potassæ, if rheumatism. Locally, to arrest the paroxysms morphia may be subcutaneously injected. Croton chloral hydrate, in five-grain doses thrice daily, will alleviate or give entire freedom from neuralgic pains connected with the head, but its effects are only temporary, as it in no way acts as a tonic. Hence a fresh pure air is indispensable to any treatment. Cod-liver oil, iron, and strychnia, are often useful (F. 4, 75, 78).

In sciatica one injection or two daily of morphia into the tissue of the nerve, or as near to it as possible, seems not only palliative, but even curative. Among other remedies which may be mentioned, stand strychnia, phosphorus, and iron, acupuncture, repeated blisters, Turkish baths, or the local application of aconite and veratria in the form of an ointment. Turpentine internally, either

in the form of the oil or confection, has long had a deserved reputation with well-known authorities, and may be adopted with this proviso, that if good is not done by its use in eight or ten days it should not be continued. For this purpose 120 grains of the oil of turpentine may be mixed with an ounce of honey, and a teaspoonful taken morning and evening. The following conditions, favourable or unfavourable to its employment, are noted.

1. There must be no alteration of the nerve structure.
2. No tumour must press on or cause the sciatica.
3. There is most chance of success when the neuralgic character of the sciatica is well marked, and when the pains are very acute. In the more chronic cases iodide of potassium has met with considerable favour, and if prescribed it should be given in large doses, from 15 to 120 grains in the course of the day. Small doses are therapeutically, in sciatica, valueless. The induced current, continued for half an hour, is sometimes singularly beneficial in this as in the other forms of neuralgia (F. 63). I have seen marked benefit follow hot and cold douches played alternately over the course of the nerve after other means had failed.

HEMICRANIA OR SICK HEADACHE.

In the course of various diseases, headache forms a prominent symptom, as in the commencement of all fevers. It is attendant on various nervous disorders (of more or less grave character), and it is also associated with gastro-hepatic derangements and diseases of the kidney and circulatory system. If the pain is in the forehead, Dr. Hughlings Jackson says it is most probably due to abdominal affections; if at the vertex, to cerebral disturbance; if at the back, to disorders of the circulation, and more especially to anæmia; if fixed, intense, localised, and attended with tenderness of the scalp, a cerebral tumour may be suspected.

In the affection called Hemicrania or Migraine, the

pain is on one side and fixed to one spot, as the temple, although it may commence as a dull pain over the forehead. The pain is more dull and sickening than neuralgia, and its great peculiarity is the throbbing which occurs with every beat of the heart, and is aggravated by every movement of the body, especially of the head. The great desire of the sufferer is to be let alone and not be spoken to. Sometimes even lying down is out of the question, and the patient can only obtain comparative ease by sitting in an easy chair. The body is cold, but the head is hot, and whilst the radial artery feels small the carotid is full. In this distended throbbing carotid, and its influence on the cerebral circulation, it is supposed, lies the source of the malady, and this again seems dependent on paralysis of the vaso-motor nerves of the same side.

The duration of a bad attack is usually several hours. It is often hereditary. It rarely commences after thirty, and subsides with advance of years. Females are more prone to it than males.

Treatment.—The patient should be kept in a darkened room and afforded complete rest during the paroxysm. A teaspoonful of tincture of guarana, given immediately before the attack, is specially recommended. Strong tea or coffee also sometimes gives relief, and pressure on the carotid or temporal artery of the same side may soothe the headache.

As prophylactic measures, mental or bodily worry should be avoided, and gastric derangement obviated.

MENIÈRE'S DISEASE.

By Menière's disease is meant a group of phenomena, to which attention was first directed by Menière in 1861, including sudden giddiness, staggering gait or tendency to fall on one side, and vomiting, along with noises in the ear and deafness on one or both sides—symptoms simulating intracranial disease. The deafness and noises

in the ear usually remain permanent, while the other symptoms pass off for a time, generally to recur again, the deafness being more complete after each recurrence. On account of the giddiness and the tendency to fall to one side, Menière believed that the cause of the phenomena in this disease was some morbid change in the semicircular canals. He based this explanation on the well-known experiments of Flourens, which pointed to that part of the inner ear as the organ which controls the equilibrium of the body. Menière's disease is sometimes designated "labyrinthine vertigo," from the supposed seat of the symptoms. It has, however, been pointed out by aural surgeons, such as the famous Von Tröltsch, that the phenomena of this disease may arise from morbid conditions in the external auditory canal and the middle ear, especially from any pathological condition which leads to abnormal pressure on the labyrinthine fluid, such as undue pressure of the stapes on the membrane which closes in the *fenestra ovalis*. It is very probable, however, that the phenomena of Menière's disease are sometimes due to a sudden change in the condition of the parts contained in the semicircular canals.

If the seat of the symptoms is not in the peripheral parts of the ear, the treatment is usually very unsatisfactory. Large doses of bromide of potassium have been recommended and should be tried.

EPILEPSY,

sometimes also termed falling sickness, and popularly, fits.

No definition can be given of epilepsy, because no definition would embrace all its phenomena. Yet it may be stated generally to be a disease characterised by certain leading features, viz. sudden loss of consciousness and sensation, with clonic spasms of the voluntary muscles, usually followed by exhaustion and coma. The essential element of epileptic paroxysms is loss of consciousness.

Etiology.—The tendency to epilepsy is often hereditary, but various other causes may be mentioned. Occurring often at puberty, it is justly considered in many cases to be a lamentable corollary of masturbation, of too early and frequent sexual intercourse, of malformations of the head, of the scrofulous diathesis, or it may be the direct result, either to himself or children, of an habitual drunkard's habits.

These are centric causes; while as eccentric sympathetic causes may be mentioned, uterine derangements, irritation of teething, and a disordered state of the stomach and intestines. Fright is a prominent exciting cause in a person predisposed to epilepsy. The first seizure occurs usually betwixt the tenth and twentieth year.

Symptoms.—These are best divided into what occurs before, during, and after a fit.

Warnings of various kinds may precede the attack. Spectral illusions, confusion of thought or speech, headache, dimness of vision, or what the patient describes as the indescribable sensation of an inward working. The most curious forerunner of a fit is what is termed the "epileptic aura or vapour." It seems to come from some distant part of the body, and patients describe it creeping along, as water may trickle or a serpent crawl, until it reaches the head or stomach, when consciousness is lost in the fit; or there may be what is termed a "motor aura" in contradistinction to this, the sensory aura, recognised by twitching or palsy of some part of the body.

With or without these precursors the fit is ushered in by a shrill cry, and the patient falls down unconscious, and struggles hard in convulsions. Unable to select a convenient place, the fall in itself may seriously hurt him. The patient gnashes his teeth, pushes out and often bites his tongue, foam gathers at his mouth, forehead and eyebrows twitch, eyes are partly open and partly shut, and the pupils are insensible to light, and dilated.

The body writhes in convulsions, or is jerked from side

to side, and what is popularly thought to be characteristic of the disease may be observed, viz. "the flexing of the fingers, and more especially the flexing of the thumb into the palm of the hand." The urine and fæces are often passed involuntarily. The fierceness and alarming nature of the attack render minutes hours to the bystanders, as a fit averages only five to eight minutes in its duration, although it may last half an hour or more.

After perhaps a more sharp convulsive movement, there is deep sleep, from which the patient awakens with utter unconsciousness of what has occurred; with headache, red eyes, dilated pupils, and a peculiar, stupid expression of countenance. This is succeeded by seemingly restored health, but ultimately by other seizures, the interval between the occurrence of which varies. Usually an interval of four or five weeks elapses, and this is followed by a series of fits, occurring at short intervals. Although epileptic attacks are not primarily fatal, yet gradually the constitution is sapped, the mental and bodily vigour impaired, and not unfrequently the unhappy victim of epilepsy ends his days in an asylum. Such is a description of what is termed the "Grand Mal," and from which a sliding scale can be traced to what is known as the "Petit Mal." Here unconsciousness may be as complete as in the severer forms, but the fits may last only a second or two, as, for instance, the person stopping in the middle of a conversation for a few moments to resume talking where he left off, quite unconscious of the fit.

Pathology.—Should death occur during a paroxysm, the brain is found more or less congested, while, in long-standing cases, it may be softened or indurated, and increased in weight. The researches of Schröder van der Kolk point to the medulla oblongata as the seat of the disease, which is supposed to be more excitable and sensible, by an increased afflux of arterial blood, or from the accumulation in the system of some *materies morbi*, which leads to an explosion, as seen by the epileptic fit.

Hughlings Jackson and Ferrier have produced epileptiform fits in animals by galvanic stimulation of certain convolutions of the brain, which if removed do not cause paralysis, but yet when stimulated give rise to these convulsions. Hence, epilepsy seems to have an explosive lesion, like the discharge of a battery, although we cannot say that an excess of energy is manifested, for we must take into account the energy required for constraint, which is taken away, and thus all energy is concentrated in the abnormal convulsion.

Treatment.—This consists of two points :—

1st, What to do during, and 2d, after a fit.

1. Chloroform may stop a fit, but it leaves the person more stupid and afflicted afterwards, and is thus inadvisable. Certain obvious duties are necessary. If the head is hot, apply wet cloths, if feet cold, warmth. The neck-tie should be loosened, and the patient placed in such a way, with head somewhat elevated, as to prevent him doing himself injury against articles of furniture. If possible, a piece of wood, cork, or indiarubber, should be placed between the teeth to prevent the tongue being bitten.

2. It is impossible to get rid of certain predispositions, such as a strumous diathesis, a misshapen head, or organic lesion of the brain or spinal cord. At the same time, some eccentric causes are remediable. If due to worms, give a vermifuge. If a syphilitic history is told, iodide of potass and the bichloride of mercury are serviceable. If dependent on vicious habits, the patient must be warned against these. The system should also be braced up by good air, cheerful society, and the shower bath, if it produces after using it a genial glow of warmth.

The bromide of potassium, with the exceptions mentioned, seems likely to supersede other forms of treatment, and its efficacy is unquestioned in epilepsy not dependent on accident or tumours of the head. It should be persevered with for at least twelve months, and the quantity taken daily should vary from 60 to 120 grains. In the next and

succeeding years it should be given in the same doses for at least two months. Should no improvement be manifested—should the fits, if not stopped entirely, not be less frequent—should the irritability or moroseness not be alleviated—then, but not till then, in any individual case can the bromide be said to have failed, and other remedies may be tried, of which the following are the most noteworthy. Counter-irritation to the nape of the neck, either by cupping, leeching, setons, or blisters. Atropine gr. ii., Spt. vin. rect. ʒij; begin with one drop and increase to 20 daily, continuing this for months, and gradually diminishing the dose. Nitrate of silver and acetate of zinc have also been recommended.

Numerous other supposed specifics might be mentioned, the fact being, as Esquirol remarks, "that epileptics are apt to improve for a time under every new form of treatment."

Careful watching is important in epilepsy, so that patients may not be in a dangerous position when a fit occurs.

CHOREA

literally means a dancing or jumping, being derived from the Greek word *χορεία*. It is the "Saint Vitus's dance" of this country, the "Saint Weit" of Germany, and "Saint Guy" of France. It may be defined as a disease most commonly affecting girls between the sixth and the sixteenth years, and characterised by irregular action and restlessness of the voluntary muscles of the face and limbs. It sometimes attacks boys. As a rule it is confined, in either sex, to the left side.

Etiology.—The exciting cause is usually fright, by which the stability of the nervous system is disturbed. Sometimes it is due to worms and to carious teeth; and, as it is often associated with a previous history of rheumatism, and with a systolic murmur at the apex of the heart, it is by many considered due to this disease, or to *embolism in some part of the cerebral circulation.* More

recent information with regard to chorea, based on the researches of Dr. Dickinson, shows that the clinical phenomena of chorea cannot be referred to any circumscribed region of the nervous centres, for they affect so many different functions of the body, and seem to be connected at the same time, or successively, and in different degrees, with the cerebral convolutions, the ganglia at the base, the medulla, and the spinal cord. On the basis of post-mortem facts, he thinks that chorea depends on a "widespread hyperæmia of the nervous centres, produced by causes mainly of two kinds, one being the rheumatic condition, the other comprising various forms of irritation, mental and reflex, belonging chiefly to the nervous system." The general health is usually below par at the time of the attack.

Symptoms.—Twitching of the muscles of the face is generally first observed. This is followed by a halting or unsteady movement of the leg, which the patient drags. Then the hand of the same side is affected, and the patient is unable to keep it in the same position for any length of time. It is jerked away from any position in which it is placed, and it is unable to retain anything within its grasp. The patient has power, but not control. The articulation is impeded, and in severe cases, the tongue, when protruded, is drawn back again with a sudden snap; but consciousness is not affected. Looking at, or drawing attention to, the patient increases the irregular movements. It may be unilateral or bilateral,—in the former case being called Hemichorea. During sleep the movements usually cease.

The duration of the disease may be stated to be from five to six weeks, although it sometimes becomes chronic and lasts several months. The disease seldom terminates fatally, except when, as rarely happens, it is very acute, and complicated with other affections, as cholera or acute rheumatism. In such cases it is attended with fever, *the spasms* being of excessive intensity, not painful, but *still* prohibiting sleep, and thus exhausting the system.

Pathology.—The post-mortem appearances in those cases which do prove fatal give little insight into the nature of the malady. In some the brain seemed perfectly healthy, in others there has been noted a serous effusion beneath the arachnoid and into the ventricles. In one case, related by Dr. Aitken, the specific gravity of the corpus striatum of the right side was increased.

Treatment.—After a brisk cathartic, combined, if there is any suspicion of worms, with an anthelmintic, the patient should have a carefully regulated, easily digested diet; and, if unable to feed herself, should be assisted to do so.

Various remedies have been recommended, as steel, oxide of zinc, sulphate of copper, nitrate of silver, bromide of potass, and chloral. None of these has been in my hands nearly so useful as arsenic, given in the form of liq. arsenicalis thrice daily (F. 4).

In the very acute cases, where a fatal issue may be feared from sheer exhaustion, it would be proper to keep the patient under the influence of chloroform for protracted periods.

It may here not be inappropriate to state that a peculiar affection of the nervous system, characterised by inability to retain the fingers and toes in any position in which they may be placed, and by their continual motion, has been termed by Hammond *athetosis* (*âtheros*, without fixed position). The conditions which occasion it are as yet unknown. It seems, however, to resist all therapeutic efforts.

DELIRIUM TREMENS'

may be defined as alcoholic poisoning, attended with a delirium in which there are great restlessness, suspicion, trembling, and various delusions.

Etiology.—The cause is drink. Distilled spirits more surely than wine; wine than beer. The man, it may be added, who, with a highly-wrought nervous organism, *drinks to excess* to drown the consciousness that he is

drinking, is more likely to be affected with delirium than the habitual swiller, who may drink to excess, but is able to sleep it off.

Symptoms.—Sleeplessness is the most characteristic symptom, and this sleeplessness is associated with busy restlessness, a chattering tongue, fidgety hands, and imaginary spectra. The tongue is protruded in a tremulous way, as in fever, but it is not brown and parched, but moist and creamy. The pulse is soft and compressible; the skin often bathed in perspiration.

The patient may coherently reply to a question or two, but soon after relapses into the fancies characteristic of the disease. These fancies are not pleasant, but associated with the lowest and most repulsive forms. Thus rats, mice, serpents, and imaginary demons, are crawling about him, and in endeavouring to escape or to destroy these his mind is sorely tried. Often he peeps suspiciously behind the curtain, draws the bedclothes over him, or attempts to leave his bed. Cowardice rather than violence is exhibited both with regard to himself and his actions towards others.

The disease tends to recovery, on the third or fourth day, by a sleep from which the patient awakes refreshed. In fatal cases the symptoms are aggravated, and attended with intense watchfulness, low muttering delirium, subsultus tendinum, and great exhaustion.

Pathology.—In fatal cases the subarachnoid tissue has been found so infiltrated with fluid as to raise the arachnoid above the level of the convolutions. The cerebral arachnoid may exhibit considerable opacity all over the hemisphere, and the ventricles may contain a small amount of fluid, while the cerebral arteries and other parts of the brain are perfectly healthy.

Treatment.—The objects in treatment are, to prevent the further introduction of the poison into the system, to quiet the nervous excitement, and to sustain the strength while the accumulation of alcohol is being thus eliminated from the system.

To fulfil these indications, all stimulants should be forbidden if the patient is young and strong. If there is a history of previous attacks, and the patient is weak, it is advisable to withdraw them gradually.

If the patient can be persuaded to take some beef-tea or chicken soup, there is not much danger in the disease nor necessity for medicinal treatment. If, as often happens, there is loathing of food, it seems advisable to place six grains of calomel on the back of the tongue. The liver is thus stimulated to action. In young subjects opium may not be necessary, but in old subjects opium with some stimulant is the best remedy. Thus 40 or 60 minims may be given of tincture of opium, and it should be repeated at intervals of six, four, three, or even two hours, until its effects have been produced, and then every twelve hours. The patient, while under its influence, should be carefully watched. Some prefer to give it with antimonial wine (F. 70); or, should the stomach be irritable, to substitute hypodermic injections of morphia. In whatever form administered, it must be remembered that the object is to produce sleep; yet if the pupils are contracted under its use without sleep, it has been pushed far enough and its use should be discontinued. In young subjects, provided there is no obstructive heart disease, chloral acts well. Thirty grains may be administered in a draught, and may be followed in two hours by the same dose. Should no sleeping effect be produced, and should excitement be more marked, it is inadvisable to continue it. Many prefer to continue it in smaller doses with the bromide of potassium (F. 69). Nourishment as indicated should be given often and cautiously (F. 69, 70).

All force, as in the form of strait jackets, should be discountenanced. The services of well-skilled attendants, combined with kindness and humouring of the fancies, seem to be sufficient, even in the most violent cases. It is well not to restrict the patient from reasonable muscular exercise, as this conduces to sleep and appetite.

SUNSTROKE.

Coup de soleil and heat apoplexy are synonyms applied to a disease prevalent in warm climates, but occurring also in this country. Two forms are observed, one in which the disease is due to the direct influence of the sun's rays, the person being struck down suddenly, with stertorous breathing, slow, full pulse, unconsciousness, and marked heat of head. In the other form excessive heat without exposure to the sun may produce, by some blood-change, phenomena similar to syncope, with weak pulse, and no stertor of the breathing.

Nothing characteristic is detected in the brain after death.

Treatment.—Apply ice or iced water freely to the head, which should be raised. Afterwards leech or cup behind the ears, and administer a purgative enema, for the first form, the true *coup de soleil*. For the second, cool the body by means of cold douches, afterwards apply sinapisms to the spine, epigastrium, and limbs; administer also stimulants. Inject quinine hypodermically (see p. 28).

HYSTERIA.

Hysteria is best known by its clinical history, as evidenced by its affecting the mind, the sensibility, motor or visceral action, or as it counterfeits other disorders.

Mental Symptoms.—These may be of the most varied character. There may be extreme talkativeness or utter silence; depression of spirits to the shedding of tears succeeded by immoderate laughter, from one and the same cause. Emotions exactly opposite to the proper ones for the occasion may be excited. A tale of grief directly affecting the patient may be greeted with every semblance of joy. Good fortune may awaken a wringing of the hands,

and a shedding of tears. The news that burglars have entered the house may induce stoical indifference. Illusions are common,—a ball rolling over the floor is mistaken for a rat ; rain on the roof for burglars entering the room. Hallucinations are equally frequent : “ One patient sees angels, another demons, another animals of various kinds.” That these disordered mental emotions, illusions, hallucinations, and other allied phenomena, are not due to insanity, is evidenced by the fact that they do not last long, nor colour much the conduct of life.

Sensibility may be increased or diminished. Pain is felt in varying situations, rarely fixed to one place, and generally described as excessively acute. Pain in the joints, especially the knee, is a common hysterical affection ; though this may be accompanied with swelling, there is no accumulation of fluid in the synovial membrane. The pain in this, as in other parts, also ceases at night ; is increased by handling rather than by severe pressure ; and may be cured spontaneously by prayer, by sudden movements, or other causes.

The organs of the special senses may be sensibly exalted, vision more keen, hearing more acute, and smell morbidly sensitive.

Anæsthesia, though not so common as hyperæsthesia, may yet be a phenomenon of hysteria. Its most common seat is the skin, and to such an extent may this be the case that no irritation of the particular part affected is of any avail, not even by the strongest Faradaic current. It is to be noted that the attacks are not preceded or accompanied by numbness.

Alterations of motion, as evidenced by paralysis, or clonic or tonic spasm. Thus there may be loss of voice, suddenly appearing and disappearing, or partial or complete paraplegia. Spasm, fixed (tonic), frequently affects the pharynx, giving rise to the sensation of a ball in the throat, “ globus hystericus.” Spasms (clonic), simulating chorea and epilepsy, are the frequent outcome of attendance on spiritualistic or revival meetings.

Digestive Symptoms are various and not uncommon; the urine is usually increased in quantity, of a low specific gravity and light colour. It is frequently voided unconsciously during a paroxysm.

Causes.—The affection is peculiar to females, especially between the ages of sixteen and twenty-five. Above all causes may be mentioned lack of aim in life, thus throwing the mind and the emotions back upon self. Hysteria is not common in savage countries, and it seems frequently to be a direct attendant of luxurious habits and perhaps ungratified desires. It is frequently met with in patients suffering from uterine or menstrual affections.

It is often hereditary.

Morbid Anatomy and Pathology contribute nothing to elucidate the mystery of hysteria. Brain, spinal cord, and sympathetic nerve, give no evidence of its former presence; neither do the generative organs, the stomach, or intestines. It seems essentially to consist in the predominance of the emotions over the intellect, and especially over the will; the intensified character of this interfering with the sensibility of various parts of the body, and sometimes deranging the contractility of the muscles.

Treatment.—Gain the confidence of the patient, and thus treatment, medicinal, moral, or dietetic, will be more apt to produce the desired effect. During the paroxysms nothing equals chloroform, though sometimes dashing water on the face and moral suasion may be sufficient.

During the period between the paroxysms the treatment must be mainly directed against symptoms. If hyperæsthesia, a full course of bromides is essential; if anæsthesia, the induced current over the affected region.

For hysterical paralysis, strychnia and phosphorus, together with the use of electricity both of the primary and induced forms, should be tried. In hysterical vomiting, bismuth or hydrocyanic acid (F. 9).

Finally, valerian, or valerianate of zinc, is a favourite remedy ; and careful attention to any menstrual disorder is necessary, should such exist (F. 14).

DISEASES OF THE SPINAL CORD.

SPINAL MENINGITIS.—Inflammation of the membranes of the cord may be either acute or chronic. It is generally caused by exposure to cold or moisture, or injuries.

It is characterised in both forms by pain in the back, which is increased by movement, and follows the course of the nerves proceeding from the diseased region ; by spasms in the muscles of the back, unimpaired reflex motion, and paralysis, varying in extent and intensity, but generally progressive to a fatal termination.

Pathology.—The lesions found after death are generally restricted to the pia mater and subarachnoid space, and consist in thickening of the membrane, turgidity of the vessels, and the effusion of fluid or of lymph.

MYELITIS.—Inflammation of the spinal cord may either be general, affecting the whole extent of the cord, or partial, restricted to a limited portion. It is more frequently the result of an injury than anything else. The symptoms vary with the seat of the disease. The most prominent, however, are pain in the back, a feeling as of a tight cord tied round the body, rapid and complete paralysis, alkaline urine, a marked tendency to sloughing of the skin, speedy loss of electric contractility, and depression of temperature in the paralysed parts.

The termination of acute general myelitis is in death, sooner or later. In the partial variety life may be prolonged, but at the expense of loss of motion and sensibility below the diseased portions.

HÆMORRHAGES INTO SPINAL CORD.—*Extravasation of blood may occur into and around the cord through*

disease of the vessels with increased blood-pressure. It is characterised by a sudden onset, local pain, reflex and motor paralysis of varying amount, and occasional jerking of the muscles. The bladder and rectum are frequently paralysed. Recovery often occurs if the hæmorrhage is not very extensive.

CONGESTION.—As the result of cold or over-exertion, congestion of the spinal cord may ensue, the chief symptoms of which are some pain in the spine, with tingling of the extremities, and paraplegia, which is, however, rarely complete. Paralysis of the bladder, with constipation, is common, but there is no tendency to sloughing or wasting of the muscles. The result is sometimes recovery, sometimes permanent paraplegia.

SOFTENING OF THE CORD is the common termination of acute myelitis, but it may originate primarily, without any evidence of inflammation, hence it has been termed “non-inflammatory softening.” The first symptom observed is numbness of those parts of the body below the seat of lesion; this is followed by want of motor power, and the two advancing together afterwards become more and more marked. The disease progresses to utter helplessness. The functions of the bladder and bowels are interfered with, and there is a marked tendency to sloughing of the skin.

The nerve cells in the gray substance are destroyed, and the nerve tubules of the white substance have their place taken by oil globules and granule masses, the constituents of which are fat.

SPINAL IRRITATION.—The term spinal irritation seems first to have been used by Dr. C. Brown of Glasgow in 1828. Its existence as a distinct disease has given rise to much controversy. Hammond, while retaining the term, thinks that it is due to anæmia of the posterior columns. It is specially recognised by the occurrence of *tender spots* in the skin or deeper tissues over one or

more parts of the spine, and by neuralgic pains shooting over different regions of the back. It is peculiar to females of a weak habit of body between the ages of fifteen and twenty-five. "In general terms, it may be stated that any cause capable of reducing the system may produce spinal irritation." In doubtful cases, where it may be confounded with myelitis, meningitis, or congestion, it is said that a hypodermic injection of one-thirtieth of a grain of strychnia will settle the difference; this invariably aggravates the symptoms of the other diseases, while it is the efficient means of cure in spinal irritation.

LOCOMOTOR ATAXY

is a peculiar form of paralysis, due to disturbed co-ordination of muscular movements. In health the muscles must contract and relax together, in unison with the movements we may desire. If one muscle contracts too soon, and another relaxes too quickly, then there is disturbed co-ordination of muscular movements.

Etiology.—The cause of locomotor ataxy is obscure, yet undue exposure to cold or damp after a long journey, venereal excesses, mental exhaustion, and syphilis, seem in some cases to lead to its occurrence.

Symptoms.—The origin is insidious. The first suspicion of there being anything wrong is frequently awakened by an inability to run, through a feeling of the legs being too heavy. This is followed by fatigue after any exertion, and by increased micturition. The desire for sexual intercourse is at this stage of the disease increased. The disease progresses often slowly, and months or years may intervene before the patient presents the well-marked symptoms of locomotor ataxy, viz. a straddling gait in movement, the foot being lifted high in the air and planted down heel first. To support his balance the patient grasps at anything that may be near, as a friend's arm or a convenient chair. He is unable to walk

in the dark, or with his eyes shut. A feeling of constriction round the waist is also complained of, as if a cord were drawn tightly round it.

In severe cases the patient cannot stand steady, certainly not with eyes shut, nor can he walk on a narrow board, the breadth required being a gauge of the severity of the affection. Usually there is diminished tactile and muscular sensibility of the lower extremities, with numbness or formication. These symptoms may be preceded by transitory pains, as well as fleeting phenomena, referable to the cerebrum, or amaurosis, difficult deglutition, etc. Electro-muscular contractility remains intact to the last. There is no palsy or wasting of the muscles, and, if the patient is placed on a chair, you cannot bend his legs against his will.

In health, if a smart tap is made on the patellar tendon while the legs are hanging loosely over the side of the bed, the foot is immediately projected forwards. In locomotor ataxy this phenomenon is absent. The stroke may be made either with the hand or a cane, but no response is elicited, thus indicating that reflex action, through disease of the cord, is in abeyance. This test for locomotor ataxy has been termed "Westphal's test" in honour of the physician who in recent years has brought it before the notice of the profession.

The eye symptoms observed in certain cases of locomotor ataxy may be summarised as—

1st, Insensibility of the pupil to light, while accommodation is unaffected.

2d, Frequently there is atrophy of the optic nerve.

As the disease progresses it does not stop at the legs, but creeps upwards. Arms, hands, and fingers, are involved. The coat cannot be buttoned, the pin put into the cravat, or the spoon carried to the mouth. The urine is passed involuntarily in bed, and now the sexual power and appetite are diminished. Thus the patient may remain for years. Ultimately the lower extremities become thinner, emaciation attacks the whole body, and

death results from general weakness, consumption, or other intercurrent disease.

It is especially a disease of males, and is rarely met with in youth, usually occurring between the ages of thirty and fifty years.

Pathology.—Locomotor ataxy depends on disease of the posterior columns of the spinal cord and posterior roots of the spinal nerves. There are atrophy and degeneration of the nerve fibres to a greater or less extent, and they become ultimately thin, translucent connective tissue cords. The anterior roots of all the nerves are normal, and there is also a healthy condition of other parts of the nervous system.

Treatment.—In the early stage of the disease it is advisable to use simple wet rubbings with water (beginning with 77° Fahr. and going down to 68°) and half baths about 86° to 70°, with simultaneous sprinkling and washing of the back. Associate this with a careful and prolonged use of electricity by means of the constant current, and endeavour to secure the action of the single poles upon the entire extent of the cord. Thus place both poles on the vertebral column, one at the nape of the neck, the other at the lumbar region. Then one pole being fixed, say the lower, the other may be moved quite slowly down over the back and thus brought in contact with the greater part of the cord; and likewise the upper being fixed, the lower may be gradually carried over the most part of the cord. The application should not exceed three to six minutes daily, and a strong current should be positively avoided. The treatment should be persevered with for months, and should only be discontinued if the patients feel more tired and poorly after each application, if their condition as a whole grows gradually worse, and if the pains increase, and sleeplessness sets in.

In more advanced cases nitrate of silver has proved beneficial, one to one and a half grains being given in divided doses in the course of a day, and the remedy may be continued until 120 grains have been used. Bromide

of potassium in some instances relieves the pain, while strychnia is decidedly objectionable, and the use of belladonna and ergot has not been attended with much success. In more advanced and completely developed cases, it is better to restrain patients from all useless attempts at any curative treatment, and simply attend to symptomatic indications, thus relieving the constipation by enemata or appropriate diet; assuaging the lancinating pains by subcutaneous injections of morphia, and seeking to secure as comfortable a life as may be for the victim of an incurable disease. Some physicians have recently spoken highly of nerve-stretching in relieving the boring pains and in arresting the progress of the disease. The nerve selected is the sciatic.

“PARALYSIS SPINALIS SPASTICA.”—This peculiar form of paralysis may be fitly termed Erb’s Spastic Paralysis, from the accurate description first given of it by Erb of Heidelberg. The clinical features of the disease in a case which came under my observation were gradually increasing paresis and paralysis in a female aged thirty-six, after a prolonged labour. The affection was located in the lower extremities, and was characterised in its advanced stage by muscular tension and reflex contractions, to such an extent that the legs could not be separated at the knees, and the heels were drawn up so as to touch the buttocks. There was no loss of sensibility and no wasting of the muscles. There was complete control over the bladder and rectum, and the intellect was clear and unimpaired. She was doomed to permanent “lying still,” but she suffered no pain, and in the condition described gave birth to a healthy child. In the early period of the disease the spastic gait was marked, and consisted in a clinging of the feet to the ground, so that movement was stumbling and uncertain. This was followed by a tiptoe hopping progression, the heel never being planted firmly, and by the body being bent forwards.

Charcot concludes that there is a sclerosis, not of the anterior or posterior columns, but of the lateral columns of the spinal cord ; but it must be remembered that this view is as yet unsupported by any post-mortem observations.

CEREBRO-SPINAL FEVER, EPIDEMIC CEREBRO-SPINAL MENINGITIS.

This peculiar disease appears to consist in an inflammation of the membranes, and sometimes also of the substance of the brain and spinal cord. Its origin is unknown, its epidemic character undoubted ; but its contagiousness is questioned. It affects chiefly the male sex between fifteen and thirty, if crowded together during cold weather, as in barracks or workhouses.

Symptoms.—The attack is sudden and characterised by intense pain in the head, prostration, with spasm and rigidity of the muscles of the back of the neck, and great sensitiveness of the whole surface of the body. The temperature of the body is abnormally low at first, and never reaches any great height. A peculiar petechial eruption is often present on the neck, breast, or limbs, of a red, purple, or black colour, and varying in size from a pin's head to three-quarters of an inch in diameter. The course of the disease is rapid, as some die within a few hours, many within twelve or twenty-four. The first four days are most dangerous ; after that time there appears to be a fair prospect of recovery. About half of those attacked die.

Treatment is unsatisfactory. Stimulants are recommended from the outset, with the application of leeches behind the ears to relieve the headache, and ice to the spine and head to mitigate the spasm. Chloral and bromide of potassium, and the hypodermic injection of morphia, have been strongly urged ; and its resemblance to malarial fever has suggested the use of quinine.

HYDROPHOBIA.

The term hydrophobia was first used by Celsus, and simply expressed one prominent feature of an affection, the pathology of which has ever remained obscure, viz. dread of water, or, it may be added, of liquids in any form. It is the result of the implantation of a specific virus; this inoculation taking place most frequently from the bite of a rabid animal, especially the dog. The skin must be wounded; the spontaneous development of the disease is never known. Wounds so occasioned are more dangerous on the hands and face than on the lower extremities, probably because the clothing worn intercepts the virus.

After the infliction of the wound there is a stage of incubation, varying from six weeks to as many months, during which time the wound heals perfectly. After this a peculiar prickling sensation is felt over the site of the cicatrix, accompanied with general symptoms of restlessness, depression, and disturbed sleep. On these supervene the terribly significant phenomenon of dread of liquids and intense thirst. As the disease progresses all attempts to drink are avoided. The sight even of a drinking-vessel containing water is intolerable, and the patient turns away his face, shrieking out at the slightest touch or breath of air. The muscles of the neck and trunk, and even the whole muscular system, contract spasmodically, with convulsive trembling of the limbs; at times, during the frenzied fits, snapping motions are made with the jaws, like biting. Although during the convulsions mental hallucinations occur, yet in the temporary cessation from these the patient responds correctly to questions, begs friends not to leave him, and, with a consciousness of impending death, may ask them to pray for him. The saliva is now greatly increased in quantity, and, as it cannot be swallowed, is ejected in all directions. *The respiration is hurried, and accompanied with a sigh-*

ing sob. This state may continue from one and a half to three days, and is succeeded by a stage of paralysis lasting two to eighteen hours, with an abatement of the distressing symptoms, but greatly increased weakness, which deepens into death. The skin is covered with a clammy sweat, pulse small and irregular, saliva running from the mouth, and accelerated breathing.

The duration of the disease in hydrophobia is only from two to four days. It always terminates fatally.

Treatment.—This is of no avail, although many remedies have been tried; yet humanity dictates the removal of every cause of excitement, the separation of the patient from everything calculated to disturb or render him anxious, and the maintenance of the strength by nutritious enemata during the temporary abatement of the spasms, or while under the influence of chloroform.

TETANUS.

Tetanus may be either idiopathic or traumatic, and, speaking generally, in both cases seems essentially to consist in an inflammatory affection of the spinal cord. It is one of the most fatal of maladies, and in its idiopathic form appears to be induced by exposure to cold or damp, especially in those who have suffered from wounds; it has also apparently been caused by worms, by abortion, and by diseases of the womb.

The first symptom is pain in the epigastric region, extending backwards to the spinal column, and due to spasm of the diaphragm. Succeeding this are stiffness of the throat, fixedness of the jaws, and difficulty of swallowing. Sooner or later there follows tonic, *i.e.* continuous, spasm of the neck, back, and loins, causing the body to assume the form of an arch (*opisthotonos*). The skin is hot, the temperature high, from 105° Fahr. to 110° Fahr.; wakefulness, thirst, and constipation are also prominent symptoms. Strychnia poisoning may be mistaken for tetanus, but it is distinguished from it by this, that there is no

epigastric pain, spasms are more rapidly developed, and do not commence in the jaw. The average duration of the disease is from three to five days. Hopes of recovery may be entertained if it extends over a week. Death results from apnoea or exhaustion.

Treatment.—This is very unsatisfactory. The favourite remedies, however, are Calabar bean, aconite, chloral, bromide of potassium, opium, and chloroform.

DISEASES OF THE SKIN.

In examining a patient suffering from skin disease it is important that a systematic and regular method of procedure should be adopted. As in other classes of affections, the diagnosis will be incomplete if due attention be not paid to the general condition—the state of the respiratory, digestive, and other organs; but besides this there are several other directions in which inquiry must be conducted in dealing with skin diseases. Ascertain (1) the patient's history: whether the eruption is acute or chronic, how long it has lasted, whether there is any evidence of contagion, recurrence of the disease, or heredity; occupation also will often throw light on the nature of a case. (2) See the whole of the patient's body if possible, and in daylight. (3) Note the *situation* of the eruption. This will often supply important diagnostic hints: thus psoriasis is known to have a tendency to appear on the extensor surfaces of the limbs, eczema on the flexor surfaces; a brown stain on the trunk would probably be tinea versicolor, on the face, ordinary ephelis. (4) Observe the *extent* and *distribution* of the eruption; that is, whether it is universal, circumscribed, diffuse, discrete, confluent, etc. (5) The *shape* of the lesions is sometimes characteristic; thus circular spots will always suggest vegetable parasitic affections, syphilides, psoriasis, or lupus. (6) Note the colour of

the eruption. In simple acute diseases it will be bright red, in strumous cases violet or vinous, in syphilitic patients often "coppery." (7) See whether the *colour disappears* on pressure; in tinea versicolor, purpura, and pigmentary affections it does not, while in simple inflammations, if there be no extravasation, it will. (8) Observe whether the eruption is symmetrical, elevated, infiltrated, or has an abrupt edge. Symmetry will usually denote a constitutional affection; elevation or infiltration an inflammatory affection; the sharply defined redness of erysipelas is readily distinguishable from the redness of simple erythema or eczema, the latter merging gradually into the colour of the healthy skin. (9) Is the eruption *moist* or *dry*? Psoriasis and many other cutaneous disorders are dry throughout; eczema is almost invariably accompanied by exudation. (10) Should the eruption be on a hairy part, the condition of the hairs as to length, elasticity, lustre, ease or difficulty with which they are extracted, state of the bulb, etc., should be noted.

The lesions observed in skin diseases are usually spoken of as *primary* and *secondary*. The former class includes maculæ, papules, vesicles, bullæ, pustules, tubercles, and pomphi. Among the secondary lesions are excoriations, cracks (or rimæ), ulcers, scales, crusts, and cicatrices.

Maculæ are spots or stains; they may be due to active congestion or inflammation, as in some forms of erythema; to ecchymosis, as in purpura; or to pigmentary or parasitic disease.

Papules are simply pimples. They are small, solid, pointed, raised above the level of the surrounding skin, reddish or pale pink in colour, and accompanied usually by itching. The principal affections in which these are seen are lichen and prurigo, diseases which are generally chronic and non-contagious.

What is a vesicle? is it large or small? Small, and consisting of a slight elevation of the epidermis. But it is more than a slight elevation. It is not solid. Prick

it and fluid exudes, which is generally transparent, but sometimes cloudy or sero-purulent. Cover one or more rain-drops with skin, and an idea may be formed of a vesicular eruption, if you suppose further that it may be placed upon skin uninfamed, not red, at other times on a red patch. Sometimes the vesicles are single, at other times in clusters; sometimes they all come out at once, sometimes irregularly. With these irregularities in situation and in appearance they also combine an irregularity in their mode of termination. There is fluid in the vesicle. How is it got rid of? By absorption or resolution in some instances, the result of this being probably a scale where the vesicle was; or it may burst externally, causing excoriation of the neighbouring parts, and where the vesicle was a scab may form, under whose protecting influence the new skin is produced. The definition of a vesicle is thus seen to be a raising of the epidermis, containing fluid, generally serous and transparent, sometimes cloudy and sero-purulent. The class *vesiculæ* comprises *Sudamina*, *Herpes*, *Eczema*, and *Cheiro-pompholyx*.

Bullæ may be considered as a sub-order of the *vesiculæ*, differing from these as a large umbrella does from a small parasol. The *bullæ* or blebs form bladder-like prominences, coming out rapidly, and containing at first serous fluid, which becomes purulent or sero-purulent. The blebs burst, and on the seat of the former elevation large black crusts form. The rapid formation, the larger size, the more distinct, black, crusty scab, and the bad health usually associated with them, alone distinguish *bullæ* from *vesiculæ*. Under this class are *Rupia* and *Pemphigus*.

Pustules differ from vesicles chiefly in this, that their contents consist of pus and not of serum. They are usually situated on a hard inflamed base, and may be accepted as an indication of a greatly deteriorated state of the general health. As pus cannot be absorbed, it seeks the surface naturally, its discharge being followed by scabbing, under which the part heals. These lesions occur in *Ecthyma* and *Impetigo*.

Tubercles, in skin nomenclature, mean simply superficial humours, which may be large or small, more or less prominent, hard, circumscribed, and persistent, which also occasionally end either in ulceration or suppuration. The tuberculæ are chronic, sometimes hereditary, and in their graver forms are peculiar to tropical climates. The affections characterised by this lesion are *Elephantiasis*, *Molluscum*, *Lupus*, *Framboesia*, *Keloid*, etc.

Pomphi, or wheals, are rounded, elongated elevations of the true skin, attended by active congestion and effusion of serum into the meshes of the skin; they are pale in the centre, appear and disappear with great rapidity, and are attended by an extreme degree of tingling and itching. Their occurrence seems intimately dependent on changes in the nervous system. They are seen principally in *urticaria*, or nettle-rash.

Excoriations are simply abrasions, and exhibit merely a ruffling or actual detachment of the epidermis. They often result from scratching.

Ulcers differ from excoriations in the fact that they involve the true skin, and when they heal they leave a cicatrix.

Rimæ, or fissures, are well seen in the cracks found on chapped hands.

Squamæ, or scales, are altered epidermis, dry, and partially detached, and easily reproduced. They may be either primary, the product of the original disease, as in psoriasis; or secondary, appearing at the termination of another disease, such as simple erythema, or scarlet fever. The scaly diseases proper are *Psoriasis*, *Pityriasis*, and *Ichthyosis*.

Crusts consist, to some extent, of epidermic scales, but most largely of dust and desiccated blood, serum, or pus.

A *cicatrix* is the mark left by the healing of a wound or ulcer. In some forms of lupus cicatrisation goes on subcutaneously, the morbid tissue being replaced by cicatricial tissue without breach of surface.

The following classification is that of Willan, considerably modified and extended :—

- Order 1. *Exanthemata* : Erythema, Roseola, Urticaria, Pellagra.
- „ 2. *Vesiculæ* : Sudamina, Herpes, Eczema, Cheiropompholyx.
- „ 3. *Bullæ* : Pemphigus, Rupia.
- „ 4. *Pustulæ* : Ecthyma, Impetigo.
- „ 5. *Papulæ* : Lichen, Prurigo.
- „ 6. *Squamæ* : Psoriasis, Pityriasis, Ichthyosis.
- „ 7. *Tuberculæ* : Elephantiasis, Molluscum, Lupus, Framboesia, Keloid, Scleroderma, Morphœa, Verruca.
- „ 8. *Pigmentary Affections* : Leucoderma, Canities, Lentigo, Chloasma, Melanoderma.
- „ 9. *Diseases of the Hair, Nails, and Glands of the Skin* : Hirsuties, Alopecia, Trichorexis Nodosa ; Onychia ; Seborrhœa, Comedo, Acne ; Hyperidrosis, Anidrosis, Bromidrosis, Chromidrosis.
- „ 10. *Parasitici* : Pediculosis, Scabies ; Tinea Circinata, T. Sycosis, T. Tonsurans ; Tinea Favosa ; Tinea Decalvans ; Tinea Versicolor.

ERYTHEMA.—There are three chief varieties of erythema—1. Simple erythema, which may be defined as consisting of superficial and usually dusky red patches, varying in size and severity, disappearing under pressure, and terminating in resolution and desquamation. It is an affection which is generally acute in its course, and it may be accompanied by little or by very considerable constitutional disturbance. It has a sub-variety, “erythema fugax,” so called from its shifting character, and its appearing and disappearing at intervals on different parts of the body. Sometimes it is observed in fevers on the face, trunk, and upper extremities, and its appearance on such occasions forms an element in determining an unfavourable prognosis. 2. Erythema papulatum is often

seen in young persons at the age of puberty, and is usually associated with some disorder of the menstrual or digestive functions. Small papules may appear on any part of the body, but as a rule, the sites selected are the back of the hands, neck, or face. These papules spread and coalesce with one another until the parts affected are covered with a red blush, which lasts for a few days and then disappears, with some itching. 3. Erythema nodosum has a knotty appearance, the knots or patches being about one or two inches in diameter, attacking the surface of the legs between the knee and the ankle. It is always attended by much gastric and general disturbance, and often by articular pains and swellings, resembling exactly those of rheumatism. It is more common among females than among males, and occurs generally between the ages of 15 and 30.

Treatment.—Mild saline aperients are serviceable for simple erythema (F. 24). Rest in bed and tonics, more especially quinine or cinchona, are recommended for erythema nodosum; if the articular symptoms be prominent, the salicylates will prove useful. Greasy applications, in all the varieties mentioned, aggravate the disease, but soothing dusting-powders (F. 55) give relief. Cloths soaked in whisky and water are also useful in the simple or papular form; while the spreading of the migratory variety may usually be checked by the application of a strong solution of nitrate of silver.

ROSEOLA.—Rose-coloured, bright spots, small and of various shapes, not much elevated above the surrounding skin, distributed more or less over the body, and accompanied by some fever, characterise this affection. The roseola seen in infants might be mistaken for measles, but it has no regular site for its eruption, at times being on the neck or buttocks, and it is unaccompanied by catarrhal symptoms but attended with some itching.

Treatment.—Alteratives, laxatives, and tonics, may be required, according to the state of the system at the time of the roseolar eruption (F. 8).

URTICARIA, or nettle-rash, bears, as its name indicates, more or less resemblance to the eruption produced by the application of a common nettle to the skin. Hence, wheals or raised elevations are observed, of irregular form and uncertain duration, with a white centre and red margin, and accompanied by more or less tingling and itching. Urticaria may be either acute or chronic. In the former the disease runs a rapid course and is attended with a smart fever; in the latter it is slow, obstinate, persistent, or tending to come and go. Both forms seem to be due to errors of diet, as eating shell-fish, cucumbers, almonds; or indigestion and uterine derangements of various kinds.

Treatment.—In the acute form give an emetic, and follow it up by a purgative. In the chronic form attend carefully to the digestion by ordering a simple diet without wine, beer, or spirits, and administer laxatives or antacids, with occasional tepid baths. A lotion containing prussic acid or perchloride of mercury is useful in relieving the local irritation (F. 55a, 57a, 57b).

PELLAGRA is a disease met with chiefly in the north of Italy, marked by successive attacks of erythema, occurring in summer, on parts exposed to the direct rays of the sun, followed by desquamation, and leaving the skin stained by increased pigmentary deposit; eventually symptoms of mental derangement show themselves. Recovery is rare.

Treatment should be begun early, and consists in giving efficient protection from the sun, and the adoption of such measures as will improve the general health.

SUDAMINA are often seen in the form of round, pearly vesicles, like drops of water, in the course of rheumatic or typhoid fever, phthisis, or any other disease accompanied by excessive perspiration.

HERPES.—Groups of vesicles, varying in size from a millet seed to that of a pea, are formed on inflamed skin,

and these vesicles pursue an acute course and spontaneously disappear in from six days in the simpler forms, to twenty days in the more complicated. Herpes, in its simplest form, is seen on the lip, sometimes in acute pneumonia, or during the progress of a common cold, or on the prepuce as the result of sexual connection. Hence the terms *Herpes Labialis* and *Herpes Preputialis*. A variety called *Herpes Circinatus* has a circular ring ($\frac{1}{4}$ to $\frac{1}{2}$ of an inch broad), with smooth skin in the centre varying from $\frac{1}{4}$ of an inch to 2 inches in width. The vesicles are often very minute, and when they dry up seem covered with small scales. Another variety to which considerable interest is attached, from its peculiar situation and its antiquity, for it was known to the ancients, is popularly denominated "shingles," or technically "*herpes zoster*." The vesicles in this case form a band half encircling the body, and following, in nineteen cases out of twenty, the course of the intercostal nerves on the right side, in the position that would be occupied by a sword-belt. The eruption of *herpes zoster* is usually preceded by some constitutional disturbance, and attended by considerable local pain. The patches vary in size from 2 to 3 inches; are red, irregularly oval, and distinct, and on this ground-work the vesicles are situated, sometimes distinct, in others run into one another. The disease lasts from fourteen to twenty days, and is succeeded by scabs. Before the eruption appears, the fever and the situation of the pain have led to its being mistaken for pleurisy.

Treatment.—Regulate the diet and attend to the bowels. Employ locally the prussic acid lotion (F 576), or dust the part with starch three parts and oxide of zinc one part. If pain be severe, as it sometimes is in shingles, it may be necessary to use aconite ointment, or to inject morphia in the course of the nerve. Protecting the part by means of cotton wool is frequently very beneficial; so also is the application of a coat of collodion, but this should be painted on before the vesicles break.

ECZEMA is the most common of all skin affections,

forming from 30 to 50 per cent of skin diseases. It consists of an eruption of very minute papules, vesicles, or pustules, on an inflamed patch of skin, crowded together, and often running into one another; or all these primary lesions may be present at different parts in the same patient. The most distinctive features of this affection are that the skin is thickened and infiltrated, and that the vesicles burst, the part then discharging a thin fluid which dries up into yellow crusts and stiffens linen. There is at first great heat and tingling in the part, and subsequently severe itching; the irritation so produced occasions restlessness, and sometimes a considerable amount of fever. In the later stages of the attack the skin dries, slight and irregular desquamation takes place, when the condition sometimes named *eczema squamosum* is presented. Various names have been given to different varieties. Thus it is termed *eczema simplex* if the vesicles are placed on different parts of the skin without much inflammation; *eczema rubrum* if the skin is very red; *eczema solare* if engendered by the heat of the sun; if by mercury, *eczema mercuriale*; or *eczema papulosum*, *vesiculosum*, *pustulosum*, *rimosum*, etc.,—terms which sufficiently explain themselves. *Eczema rubrum* is one of the most usual forms, and is often preceded by gastric derangement and smart fever; it is apt to be mistaken for *erysipelas*, especially on the face, but may be distinguished from it by the presence of vesicles and the absence of the characteristic sharp line of demarcation; *erysipelas* also is usually preceded by rigors, and attended by a more rapid pulse and a higher temperature. *Eczema* is often a chronic affection, and some forms, such as infantile *eczema*, occasionally prove very rebellious to treatment.

Treatment.—For the *eczema* which occurs in infants, Dr. Erasmus Wilson considers small doses of calomel at moderate intervals as specific, followed by Fowler's solution, in doses proportionate to the age of the child, the oxide of zinc ointment (F. 59a) being applied externally. Another method which gives good results is the

administration of powders containing rhubarb, bicarbonate of soda, and gray powder or quinine; locally, after scabs and crusts have been removed by oiling, and, if necessary, by poulticing, an ointment composed of one drachm of oxide of zinc to an ounce of vaseline may be applied, combined, when the part will bear stimulation, with 30 to 60 grains of pitch ointment. The child's diet must also be carefully inquired into and regulated. In the other varieties general measures must be trusted to,—saline laxatives, mineral acids, sarsaparilla, and especially cod-liver oil; in severe and chronic cases the iodide of potash or Fowler's solution should be tried. The local treatment is of quite as much importance as the constitutional. If the parts be acutely inflamed, and the seat of much heat and swelling, local measures must as a rule be avoided; or soothing powders or lotions may be used (F. 55, 57*a*, 57*b*, 57*c*). When the affection has become chronic, it is necessary to have recourse to stimulating applications; of these, the most generally useful are the various preparations of tar, oil of cade, or oleum rusci (F. 60, 60*a*). With these mercurials may be combined, especially if there be much itching, (F. 64*b*). For sub-acute eczema, especially of the extremities, a modification of Hebra's unguentum diachylon, composed of equal parts of lead plaster and vaseline (F. 59), answers very well; it should be applied on strips of lint. If much thickening and induration of the skin remain, the preparations of potash will render good service (F. 57*d*, 57*e*).

CHEIRO-POMPHOLYX.—This affection is marked by an eruption, invariably symmetrical, of small round vesicles or blebs, chiefly on the hands and feet, and attended by little or no redness of the skin, and by no eczema; it is very apt to recur. The vesicles are deep-seated and flat on the top, and soon dry up and scale off; they contain a clear, alkaline serous fluid. The nails also are often attacked, being loosened, and broken across at the root.

Treatment.—As the disease often appears in nervous

and debilitated subjects, tonics, such as quinine and iron, will be useful. Locally, simple vaseline may be applied, or vaseline with a little tar ointment or liq. carbonis deterg.

PEMPHIGUS.—The eruption, consisting of large bullæ, is usually preceded by fever and constitutional disturbance, and locally by irritation and itching. The bullæ may be two or three inches in diameter, and are either separate or run into one another, and when they burst are succeeded by large brown crusts. The disease is one of debility, favoured by intemperance, bad diet, or cold, or it may be due to syphilis. The course is chronic.

RUPIA is generally syphilitic in its origin. Small flat bullæ arise, containing serous fluid at first, which degenerates into blood and pus. A thick black scab is formed, and beneath it unhealthy ulceration progresses, as evidenced by a nasty-smelling discharge. The margins of the surrounding skin inflame, more serum is poured out, and the incrustation takes on a stratified appearance, resembling a limpet shell. The lower limbs and loins are the usual sites of Rupia. Its duration may vary from two or three weeks to several months.

Treatment.—Both these diseases being attended with debility, a generous diet and fresh air, with wine and tonics, are essential. If of syphilitic origin, iodide of potassium, with Plummer's pill or the perchloride of mercury, may be administered. In non-syphilitic pemphigus, Fowler's solution of arsenic, in five-minim doses after food, may almost be depended upon to effect a cure. Locally, poultice, and use antiseptic dressings (F. 3, 5). Or better, dust the sore with iodoform.

IMPETIGO.—The pustules characteristic of this disease are sometimes crowded together, at other times distinct,—hence the division into impetigo *figurata* and *sparsa*. In both divisions the pustules break, and are succeeded by *scabs*, with a peculiar candy-sugar appearance, if observed on the face. The crusta lactea of young children is

simply an impetiginous eruptive mask. The variety "sparsa" is sometimes distributed over a wide area, as the limbs, the body, or buttocks.

Impetigo generally attacks young, scrofulous, ill-fed children, or elderly debilitated people.

ECTHYMA may be confounded with impetigo, as both diseases are pustular and attended with scabs; but in ecthyma the inflammation is of a more severe type, and there is more constitutional disturbance. The pustules are usually separate, with a hard inflamed base, and terminate with a dark-coloured scab. The latter leaves superficial ulcers, followed by cicatrices. Ecthyma may occur spontaneously, or follow the application of some irritant to the skin.

Treatment.—This is similar to what was mentioned in the previous diseases, viz. cleanliness, good living, and good air, with wine and bark. If the scabs are large, apply a charcoal poultice and a sedative ointment of acetate of lead and lard, or (F. 57c, 59a, 61).

LICHEN.—There are three great varieties of lichen: l. simplex, l. circinatus (or circumscriptus), and l. ruber (or planus). Lichen is an inflammatory affection of the skin, chronic in its course, characterised by the eruption of persistent papules, arranged in groups, or scattered thickly over the surface, and associated usually with much itching. In *lichen simplex* these papules are about as large as a millet seed, and are found chiefly on the back and extensor surfaces of the limbs. This variety is considered by some to be simply abortive papular eczema. In *lichen circinatus* the papules are arranged in round groups, or more commonly in perfect rings, which spread circumferentially, leaving the skin in the centre normal, or stained of a yellowish-red colour. These patches occur generally on the chest and back. In *lichen ruber* (or *planus*), a disease of middle life, the papules are very large, flat and smooth, covered on the top by a thin, glistening scale, are deep purplish-red in colour, and

are developed round the hair follicles ; they are very persistent, and when they disappear they leave behind them deep dark stains. The eruption occurs in patches, at first on the limbs, but subsequently also on the body ; it is often symmetrical, and is accompanied by intense itching. What is known as *lichen agrius* is simply acute eczema ; it constitutes the grocers', bakers', and bricklayers' itch. In it the papules are situated on red inflamed skin, and there is much pain, tingling, and heat, general feverishness, nausea, and vomiting ; the tops of the papules are often broken off, and there is in consequence a thin serous discharge, the skin being left fissured with deep and painful cracks. In the lichen of scrofulous subjects, *l. scrofulosorum*, a very chronic variety, the papules are very small and pale, appear only on the trunk, cause almost no itching, and are arranged in patches or circles.

Treatment.—In lichen the local treatment consists in the allaying of the severe itching by baths, sedative ointments, or lotions (F. 55a, 57a), or by weak tarry applications (F. 60a, 64b), while the digestion is aided by mild laxatives and a simple diet. Cleanliness must be insisted on. In *l. circinatus* especially, and also in the other forms of lichen, arsenic is most valuable. In *l. scrofulosorum* cod-liver oil must be used, both internally and externally.

PRURIGO is a chronic papular affection, accompanied by intense itching, and often associated with uncleanness and other sources of irritation, such as flea-bites, etc.; its severer form, the true prurigo of Hebra, is almost never seen in this country, and is quite incurable. Two varieties are here met with—prurigo mitis and relapsing prurigo. The former occurs chiefly in badly-nourished children or infants, and consists of an eruption of small pale papules, which make the skin feel "hard, rough, and dry, like a nutmeg grater," when the hand is passed over it. The severe itching leads to scratching and the formation of bloody crusts. Relapsing prurigo begins about puberty ; in it the papules are red, and are distributed principally

on the face, neck, and arms ; seldomer on the trunk, and almost never on the lower limbs. It may last for years, has a decided tendency to return, and is much worse in summer than in winter.

Treatment.—Remove every source of irritation, such as flannel underclothing, pediculi, etc., from the skin. Absolute cleanliness and alkaline or tar baths will relieve the prurigo of children, cod-liver oil and iron being given internally. In relapsing prurigo, tarry applications externally, and arsenic internally, prove useful.

PRURITUS is a functional affection of the skin, often confounded with the foregoing. It consists essentially of intense itching, and the changes to which this leads, namely, pigmentation, excoriations, or eczematous or pustular eruptions. It is connected most commonly with dirt, old age, nervous disease, and atrophic change in the skin. Examples of it are found in *pruritus senilis*, *p. ani* (often due to piles or uterine disease), *p. genitalium* (sometimes caused by diabetes or gout).

Treatment.—Locally, treat as for prurigo. Internally tonics are indispensable ; iron, quinine, cod-liver oil, and strychnia (F. 80).

PSORIASIS is a common chronic skin eruption, marked by the proliferation of white silvery scales from thickened patches of skin, with a hyperæmic base, usually circular in shape, and of variable size. Healing commences from the centre, which gives rise to the characteristic appearance of rings of eruption. It is dry throughout its whole course, and is accompanied by slight itching. It is very often arranged symmetrically, and is most common on extensor surfaces, and the points of the elbows and knees. It may involve the whole surface, but is rare on the palms and soles. When the spots are exceedingly minute the eruption is termed *psoriasis punctata* ; when somewhat larger, *p. guttata* ; *p. nummularis*, *orbicularis*, *gyrata*, *diffusa*, *universalis*, *inveterata*, are names which require no explanation. *Psoriasis* is frequently hereditary, is very apt to

recur, and often seems in no way to affect the general health. *Syphilitic* psoriasis is not uncommon on the palms and soles, is somewhat coppery in colour, and its scales are thick and less silvery than in simple psoriasis; the patient's history, the discovery of other signs of syphilis, and the presence of other syphilitic eruptions on the body, will confirm suspicion in any doubtful case.

Treatment.—In simple non-specific psoriasis arsenic should be given; even alone it often suffices to effect a cure. Tar capsules and carbolic acid have also been given with advantage in some cases. In the syphilitic variety the triple compound of arsenic, iodine, and mercury (Donovan's Solution) is valuable. Locally, the scales must first be removed by vigorous rubbing with soft soap. Then apply tar ointment, oil of cade, oleum rusci, or the liq. carbonis detergens. Of late an ointment containing chrysophanic acid has been employed with wonderful success, even without any internal medicine, and seems likely to supersede all other remedies. Like many others, I can corroborate Mr. Balmanno Squire's statements as to its marvellous efficacy (F. 65a). It appears to act constitutionally as well as locally; in several cases in which I had it applied to one side only, the other extremities being safely wrapped in cotton-wool, it promptly effected the removal of the eruption from the *whole* of the affected surface. In dandriff, citrine ointment, glycerine and rose-water, or (F. 64, 64a), does much good.

PITYRIASIS RUBRA is a formidable disease, not unfrequently fatal, and often accompanied by renal disease and albuminuria. It is characterised mainly by intense redness of the entire surface of the body, excessive exfoliation of epidermis, and absence of infiltration of the skin and of moist exudation. The skin is tender, but not very itchy. The constitutional symptoms are severe, and are those chiefly of exhaustion and debility. It is by *some* regarded as a dry universal form of eczema. The *vivid* redness of the skin, and the great size of the epi-

dermic flakes which fall off, sufficiently distinguish it from other desquamative diseases.

Treatment is too often futile ; though Fox states that by soothing applications externally, and the administration of diuretics and then tonics internally, really remarkable results may be obtained. The tender surface is thus protected, while the hyperæmia is subdued and tone and strength are restored to the system.

ICHTHYOSIS (or *fish-skin*) is simply an exaggeration of the condition known as *xeroderma* or dry skin. It is usually hereditary, and is marked by suppression of the secretion of perspiration, and an increased development of epidermis. The skin is therefore dry, harsh, scaly, and cracked, the peculiar shape of the scales giving the disease its distinctive name. It appears first and is most severe on the extensor aspect of the joints.

Treatment.—The disease is incurable ; but the patient may be made more comfortable by warm baths, followed by thorough inunction with almond oil or glycerine and water. Cod-liver oil should be given internally.

LUPUS is the principal tubercular skin disease seen in this country. Its essential feature is the deposition in the skin of a new cell-growth resembling granulation tissue, which tends continually to invade the surrounding healthy parts ; in the variety known as *lupus exedens* these nodular deposits ulcerate, in *l. non-exedens* they do not. In the non-ulcerative form the nodules, which are small, softish, and red, and attended by no pain, become covered with little white scales, then a sort of fatty degeneration occurs, the nodules shrink and die away, leaving a loss of substance in the form of a depression. In the other form ulceration instead of absorption sets in, the neighbouring tissues are invaded, and the edges are thick and red. It sometimes destroys the whole nose, including the mucous membrane and bones. Both varieties appear to be connected with scrofula, to be most common between the ages of fifteen and twenty-five, and to affect by preference

the face, especially the nose and cheeks. Another variety of lupus is *l. erythematosus*. It is superficial in character, and occurs most often in females, usually appearing first as an irregular reddish or violet-coloured spot on the nose, whence it spreads on both sides to the cheeks, producing the well-known butterfly-shaped patch; it may be developed on any part of the face, however, and has been seen on the scalp. This erythematous condition is followed by superficial cell-infiltration, gradual breaking-down of the tissues involved, a shallow cicatrix remaining. Its course is very slow. In its early stages the patches are sometimes covered by firmly adherent greasy crusts.

Treatment.—The scrofulous nature of lupus necessitates tonics, especially cod-liver oil combined with syr. ferri iodidi, or with acids and bitters. In the severe form, if there is any history of syphilis, use Donovan's solution or iodide of potassium, with sarsaparilla. Locally, for the non-ulcerating form Mr. Wilson recommends the acetum cantharidis; while for the ulcerating type caustic applications are called for, such as chloride of zinc, nitric acid, and potassa fusa, or the lupous tissue may be scraped away with a curette. The thermo-cautery applied under chloroform is specially serviceable, and leaves little after pain. For lupus erythematosus a local application of tincture of iodine, or equal parts of carbolic acid and glycerine, or an ointment composed of half a drachm of liq. carbonis deterg. to an ounce of vaseline, may be employed.

PIGMENTARY AFFECTIONS.—The pigment which is naturally present in the various tissues may be entirely absent not only from the skin, but from every other part of the body, as in albinos. In *Leucoderma* (or *Vitiligo*) this loss of pigment is confined to rounded, smooth patches scattered irregularly over the body; the margin of each patch is defined by a ring of abnormally deep pigmentation, and the hairs which grow on the affected part are usually also white. In *melanoderma* there is a generalised increase of skin pigment; in *chloasma* and

lentigo this increase is limited to sharply defined spots. Long-continued exposure to great heat or to the sun's rays, or prolonged local irritation, may cause these anomalies of pigmentation; and it must be remembered that similar changes are observed in Addison's disease, leprosy, syphilis, and *tinea versicolor*.

Treatment.—For loss of pigment no successful method of treatment has yet been discovered. For *lentigo* or *ephelis* (freckles), keeping the parts moist with a lotion of corrosive sublimate and chloride of ammonium (F. 58*b*) is effectual; or a lotion of hyposulphite of soda, half a drachm to the ounce of water.

HIRSUTIES, or undue growth of hair in abnormal situations, may sometimes be cured by the cautious use of depilatories (F. 65*e*). A more satisfactory method of treatment is to destroy the hair-papilla by means of a needle thrust to the bottom of each follicle, or by means of the electrolytic needle, the inflammation so excited obliterating the hair follicle completely.

ALOPECIA (or baldness) may be the result simply of hereditary peculiarity, or ordinary senile atrophy, in which the hair papilla takes part with the other tissues; or it may be due to syphilis, the eruptive fevers, parasitic disease, *seborrhœa*, or nervous affections.

Treatment.—While the cause of the baldness must be specially treated, the growth of the hair may be favoured by stimulating local applications (F. 62), and by general tonics. In syphilis the hair will certainly grow in again under suitable constitutional treatment.

SEBORRHŒA is the term applied to a condition of undue excitement of the sebaceous glands, with great increase of the sebaceous secretion. *Seborrhœa sicca* is most common in women, occurs usually on the scalp, and is accompanied by the abundant shedding of thin scales, and by thinning of the hair. It is attended by no inflammation or infiltration of the scalp, and the crusts formed

consist to a great extent of fatty debris, and can be kneaded into a ball or pellet. *Seborrhœa oleosa* is met with usually on the face, especially of tipplers, and is often associated with acne rosacea. The secretion here is abundant, thin, and oily.

Treatment.—Tonics and arsenic internally. Locally, remove the crusts and apply gently stimulating ointments, such as white precipitate (F. 64, 64a), or a lotion of borax, glycerine and water, ten grains to the ounce.

COMEDO is characterised mainly by thickening of the skin and plugging of the hair follicles by masses of dry sebum, the protruding tip of this plug being usually blackened by the dirt adhering to it. It is most common at puberty, and is found most often on the face and shoulders. In the sebaceous plugs are found large numbers of minute hairs, and occasionally the *acarus folliculorum*, a parasitic animal whose habitat is the hair follicle.

Treatment.—Expression of the sebaceous masses. Steaming the face at night, followed by vigorous friction and the application of stimulating ointments or lotions (F. 57f), will usually prove successful.

ACNE consists of an eruption of pustules produced by inflammation of the hair-follicles and sebaceous glands; being frequently merely a more advanced stage of Comedo, it is found in the same situation and in patients of the same age and type. If there be much surrounding induration, the affection is termed *acne indurata*. *Acne rosacea* is a variety associated with intemperance, good living, or stomach or liver diseases. It appears usually about the nose and mouth, is accompanied by much hyperæmia, and many tortuous and widely dilated vessels are seen winding over the surface.

Treatment.—In acne simplex and acne indurata much the same line of treatment as for comedo should be adopted; in the severer forms the iodide of sulphur ointment may be used (F. 65). In acne rosacea the diet should

be regulated and the drinking habits stopped ; locally, the application every night of the liquid extract of ergot is said to be useful.

BROMIDROSIS, foetid perspiration, usually of the feet or axillæ, is stated to be due to the presence of a specific organism, the *bacterium foetidum*. It may be successfully treated by antiseptic lotions, such as a saturated solution of boracic acid, which should be freely used locally.

PARASITIC DISEASES may either be of vegetable or animal origin, and all are contagious provided the parasite is implanted in a suitable soil.

PEDICULOSIS is the condition of skin induced by uncleanliness and the harbouring of lice about the person. There are three varieties of pediculi. The *pediculus capitis* infests the head, especially of children, where its presence excites great itching and irritation, the scratching to which it gives rise occasionally causing eczema. The "nits" or ova of the lice, small white bodies, adhere to the shaft of the hair. The *pediculus corporis* is larger than the head louse, and its ova are deposited on the clothing, not on the skin. The itching which it excites is intense. The great irritation brings out numerous small pale papules, especially on the breast and back ; the tops of these are scratched off, and are usually seen covered by a small scale of coagulated blood. After some time the skin deepens in colour from increased pigmentation. The *pediculus pubis* is found chiefly about the genital organs, or occasionally in the eyebrows and eyelashes. It is seldom seen in children.

Treatment.—For head lice or pediculi pubis nothing is better than carbolic oil (1-8) or the 5 per cent solution of oleate of mercury ; if the latter remedy be combined with a little acetic ether it will rapidly destroy the nits. Carbolic lotion (1-20) will kill body lice ; the clothing should also be exposed to the action of dry heat at a temperature of at least 250° F.

SCABIES depends on the presence of an animal parasite,

the *acarus scabiei* or *sarcoptes hominis*. The insect is rounded, somewhat like a tortoise in general shape, and is provided with eight legs. The male is smaller than the female, and wanders freely over the surface. The female pierces the cuticle, and forms under it a short S-shaped burrow or cuniculus, at the end of which is a small vesicle within which the insect lies; in the burrow will be found ten to fifteen black dots, the insect's eggs. It most frequently attacks the flexures of joints; notably it is first observed between the fingers, and thence it may spread over the whole surface of the body with the exception of the face, where it is never seen save in a few cases in infants. The deposition of the acarus acts as an irritant; a vesicular eruption is formed, and with this is associated much itching, which is specially increased by warmth. The only certain evidence of the presence of the disease is the discovery of the insect and its burrows, but in the absence of this the following points are usually held to warrant such a diagnosis:—(1) A clear history of contagion, several members of the same family being generally affected; (2) the steady spread of the disease from one part to another; (3) intolerable itching, intensified by warmth, pain and the burning sensation characteristic of eczema being absent; (4) the detection of small pointed vesicles between the fingers and on the flexor and ulnar aspects of the wrists, with a pruriginous eruption on the front of the forearm, on the mammæ, genitals, and inner side of thigh, the face and scalp being in adults invariably untouched. A valuable diagnostic sign in children is the presence of the eruption round the ankles, on the buttocks, and on the ulnar side of the wrists.

Treatment.—The acarus is most easily destroyed by the application of sulphur ointment (F. 606). This should be rubbed in firmly for three nights in succession, and washed off by a warm bath on the fourth day, when the underclothing should be changed. The clothes worn should be fumigated by sulphurous acid gas, or destroyed.

If the sulphur be continued too long, it gives rise to a very troublesome artificial eczema. In infants, and those whose skin is too irritable to bear the sulphur application, storax (F. 60c) may be used.

TINEA FAVOSA or FAVUS, a very obstinate and chronic affection, is due to the presence and growth of a fungus, the *achorion Schönleini*. It is most commonly met with on the scalp, though it may occur on other parts of the surface. In the early stages the patches are irritable and scaly, and the hair becomes harsh, dry, and quite lustreless; bright sulphur-yellow crusts, small and distinctly cup-shaped, are soon formed, and through the centre of each of these pass a few hairs; eventually the crusts fall off, leaving dark stains, and a scaly surface. The pressure of the fungus may destroy the hair-papilla, when permanent baldness results. The odour of the parts is said to be like that of cats or mice.

TINEA TRICOPHYTINA is in all its modifications connected with the presence of a fungus named the *trichophyton tonsurans*. It is popularly known as ringworm, more especially when it attacks the head or body. On the scalp it is known as *tinea tonsurans*; on the hairy parts of the face, as *tinea sycosis*, from the resemblance of the affected part to the pulp of a fig; on the general surface of the body, as *tinea circinata*; the affection designated *eczema marginatum* is simply a severe form of this disease, met with generally in tropical countries.

Tinea Tonsurans is commonly seen in children, rarely in adults. At the outset the rings or patches are simply red, slightly raised, with a few small vesicles at the edges; subsequently there are observed round or oval, scaly or scurfy patches of comparative baldness, on which the hairs are dry and shrivelled, usually broken off short at the surface of the skin or a line or two above it, in such a way as to suggest the appearance of a stubble-field; the hairs are brittle, and apt to break just within the follicle when epilation is attempted. At a still later stage the

diseased part of the scalp may become inflamed, soft, and boggy, as if the seat of an abscess, and the follicles may suppurate or discharge a clear gummy fluid; this is the condition sometimes described as *tinea kerion*, and is one of nature's methods of cure. In disseminated ringworm of the head the scalp is scaly, with here and there a few dry, shrivelled, and brittle hairs, and a few of the stumps above mentioned.

Tinea sycosis is characterised by pustular inflammation of the hair-follicles, the pustules being placed on little hard eminences, and terminating in yellowish-brown crusts.

Tinea circinata is marked by distinctly circular patches, which tend to spread steadily at all parts of their circumference; in extent they vary from the size of a shilling to that of a half-crown; their margins are red, raised, and slightly vesicular, while the centre has a yellowish-brown colour, with a tendency to scale.

TINEA DECALVANS (*Alopecia areata*) affects the beard, scalp, and eyebrows, and presents smooth, ivory-white, sharply-defined bald patches of a circular form, which may so extend as to cover a large surface and leave the patient absolutely destitute of hairs. It is usually developed suddenly, attacks persons of all ages, and runs a chronic course, the first indication of improvement being the growth of small, downy, pale hairs, named *lanugo*. Most authorities regard it as due to the presence of a fungus named the *microsporon Audouini*; but its parasitic nature is doubted by some, who attribute its occurrence to disease of the nervous system, or to a wave of inflammatory or other influence, which, as it passes over each hair papilla, leaves it enfeebled and dying.

TINEA VERSICOLOR (*Pityriasis versicolor*, *Chloasma*) is produced by the growth of the *microsporon furfur*. It is characterised by the occurrence of yellow or fawn-coloured patches, often very symmetrical, on the chest

and abdomen, occasionally on the upper arm or thigh ; these are rough to the touch, and covered with fine branny scales. It is sometimes accompanied by considerable itching. It is a disease of adult life, and never attacks uncovered parts.

Treatment.—In all forms of tinea this must be both local and general ; local to destroy the parasites, general to strengthen the system and prevent the skin forming a suitable soil for their development. The general treatment consists in cleanliness, good hygienic conditions, nourishing food, cod-liver oil, syrups of the phosphate or iodide of iron (F. 81, 85).

Locally, poultice to remove scabs, then clip the hair and epilate carefully in and around the diseased patches, this epilation being particularly necessary in favus and sycosis ; afterwards some parasiticide application must be employed, such as sulphurous acid, either pure or diluted, or oil of cade. In favus the part may be blistered, or a lotion of corrosive sublimate (F. 58, 58a), or the white precipitate ointment, should be used perseveringly ; hyposulphite of soda lotion, 60 grains to the ounce of water, is also effectual. In ringworm of the body a solution of nitrate of silver, or tincture of iodine, or acetic acid, is sufficient. For sycosis employ, after epilation, (F. 65) or any of the ordinary parasiticides. Ringworm of the head, if extensive, is obstinate ; for it, after carefully extracting the diseased hairs, apply oleate of mercury, sulphurous acid, carbolic acid and glycerine, or Dr. Alder Smith's *compound citrine ointment* (F. 57g, 65b, 65c). Tinea versicolor is readily removed by vigorous rubbing with soft soap and warm water, applied with a piece of flannel ; F. 58a is still more effectual. In tinea decalvans occasionally blister, or use (F. 58).

MEDICINAL RASHES.—Certain drugs, taken internally, are apt to give rise to skin eruptions. Belladonna or its alkaloid, stramonium, and hyoscyamus sometimes cause *intense hyperæmia*, closely resembling the eruption in

scarlet fever. Quinine sometimes brings out patches of erythema; arsenic, a purplish staining of the skin or a herpetic eruption; iodide of potassium, purpuric spots on the legs, or pustules, like those of acne, on the face, back of neck, and shoulders; copaiba, a dark red, raised, hyperæmic or hæmorrhagic rash, not unlike that of measles, seen most usually about the ankles and wrists; bromide of potassium, erythema and acne round the mouth and nose; chloral hydrate, a dusky erythematous eruption, sometimes combined with urticaria, found most often about the face and neck; mercury, an obstinate form of eczema; tar and allied substances, a very itchy variety of erythema.

The external use of certain drugs is apt to give rise to skin eruptions. Thus tar sometimes produces a form of acne; arnica, an erysipelatous inflammation; while the erythema caused by mustard, turpentine, or other irritants is often followed by desquamation and brown staining, which may be permanent. Croton oil and remedies of that nature sometimes excite a very acute eczema, which leaves well-marked cicatrices.

Treatment.—These eruptions, after the drug which has caused them has been withdrawn, should be treated simply on general principles.

APPENDIX.

METHOD OF PERFORMING POST-MORTEM EXAMINATIONS.

BEFORE opening the body the external appearances are to be observed—the presence of injuries or marks of any sort, the state of the post-mortem rigor, and the cadaveric lividity, as well as the degree of coldness of the body, are to be carefully noted.

Head.—It is better to begin by opening the head, for the condition of the blood-vessels in the meninges can thus be more accurately examined, than if, the chest having been opened, the blood is permitted to flow out at the cut ends of the large veins. To open the head, make an incision across the vertex from ear to ear, quite down to the skull. In making this incision the most ready means of parting the hair is to cut the skin from one ear to the other, from within outwards with the back of the knife to the skull; and this preliminary cut having been made, it can be deepened by a second sweep of the knife. With the chisel, the scalp, including the periosteum, is now pushed forwards over the brow, and backwards over the occiput, giving room for the saw to pass round the skull in a horizontal plane about $\frac{3}{4}$ inch above the orbit, and $\frac{1}{4}$ inch above the occipital protuberance. The saw-cut should not go quite through the two tables; the inner one is to be cracked in the line of the saw-cut with the chisel and mallet, the latter of which may then be used to prise the skull-cap off. In cases of injury to the head, it is better to carry the saw-cut quite through both tables all round, and then cut the brain clear through at that level with a long knife.

Split up the longitudinal sinus with fine scissors, and with a probe-pointed bistoury divide the dura mater all round along the edge of the skull, and cut the attachment to the crista galli. Then pull the dura mater backwards, exposing the surface of the arachnoid. Now remove the brain from before backwards.

taking care not to tear any part of it, and divide the spinal cord as low down as possible. Examine the base of the brain, remove the dura mater from the base of the skull, and examine the bone, opening the internal ear if necessary with the chisel.

The examination of the interior of the brain itself is begun by opening the lateral ventricles by two longitudinal incisions along the corpus callosum; after which the knife is laid parallel to the corpus callosum, and the brain is sliced laterally in such a way that each cut stops just short of the convex surface of the hemisphere. The third, fifth, and fourth ventricles may now be opened; and finally a series of closely placed transverse incisions may be made across the corpora striata and optic thalami, to expose their texture; in every part. The medulla oblongata is split longitudinally, and a cut through each half of the cerebellum may be made.

Trunk.—With a strong knife an incision is made down the middle line of the trunk, from the suprasternal notch to the pubes, opening the abdominal cavity. The soft parts are held back from the lower edge of the thorax, and an incision carried through the peritoneum along the lower costal cartilages, after which the dissection of the flesh from the front of the thorax can be done with long sweeping cuts. The costal cartilages are then cut half an inch from the anterior ends of the ribs, beginning with the second cartilage, and thence downwards to the lower margin of the thorax, the cut passing outwards as it descends. In cutting these cartilages hold the knife with the handle level, so that as each cartilage is cut the edge of the knife may fall on the next cartilage, and not plunge into the lung; but in cutting the first costal cartilage, which must next be done, the knife is to be held perpendicularly with the edge towards the clavicle, and directed rather outwards to avoid the manubrium sterni. Then cut the sterno-clavicular and costo-clavicular ligaments by an incision curved from above downwards and outwards, and remove the sternum. Note the position of the heart, etc., and the state of the pleuræ and peritoneum, and open the pericardium, pinching up a part of it and cutting it horizontally. Having observed its contents, open the heart. This may be done *in situ* by two incisions along the anterior and posterior borders into the ventricles; or the heart may be removed, and afterwards opened by the incisions just mentioned, followed by a cut along each side of the septum ventriculorum from the apex into the pulmonary artery and aorta. The state of the valves and of the heart tissue, and of the ascending arch of the aorta, can then be studied. The lungs may now be removed and divided by one long cut from apex to base. The bronchi are split up with scissors, and the trachea and larynx similarly split up with the knife. If desired, the

great median incision first described may be continued up to the chin, and the tongue, fauces, larynx, and upper half of the gullet, can be removed bodily and examined in detail afterwards.

Now divide the diaphragm so as to let the liver fall back into the chest, open the stomach (if this has not already been done), and clean out its contents. Then examine the spleen, kidneys, ureters, bladder, and urethra, not forgetting the suprarenal capsules. The state of the gall bladder and its duct must now be ascertained. For this purpose carry the incision in the stomach along the duodenum, past the orifice of the ductus communis, wipe the surface of the mucous membrane, and putting gentle pressure on the gall bladder, note whether the bile flows freely from the duct. Then examine the portal vein and remove the liver, which you may divide by long transverse incisions. To examine the bowels, remove them from the body, separating them with the knife along the edge of the mesentery as close as possible to the gut. Split the gut from end to end with the gut scissors, and examine the mucous surface under a stream of water.

The mesenteric glands, aorta, and pancreas may next be looked at, and then the front of the spine should be cleared of all soft tissue. Any lateral curvature or exostosis will thus come into view, and the spinal canal can then more readily be opened. This may be done from before or behind. If from before, the bodies of the vertebræ are to be separated by saw or chisel; if from behind, the cadaver must be laid prone, and a longitudinal incision made from the occiput to the sacrum, the soft tissues removed from the spinal arches, which are then to be cut with the saw and forceps.

WEIGHT OF ADULT ORGANS.

	MALE.	FEMALE.
Brain . . .	49 oz.	44 oz.
Heart . . .	10 oz.	9 oz.
Lungs { right . . .	24 oz.	17 oz.
{ left . . .	21 oz.	15 oz.
Liver . . .	53 oz.	45 oz.
Spleen . . .	4 to 10 oz.	4 to 10 oz.
Kidney . . .	4½ oz.	4 oz.

TABULAR STATEMENT OF CHIEF POINTS IN FEVERS.

	Incubation.	Eruption appears on	Eruption fades on
TYPHUS . . .	usually 1 to 14 days	{ 5th day of fever on back and sides	{ 14th day of fever.
TYPHOID . . .	14 to 21 days	{ 7th or 8th day of fever on abdomen	{ 21st to 30th day of fever.
SCARLET FEVER . . .	4 to 6 days	{ 2d day of fever on trunk	{ 5th day of fever.
SMALLPOX . . .	12 to 14 days	{ 3d day of fever on face and forehead	{ scabs form on 9th or 10th day of fever, and fall off about the 14th.
MEASLES . . .	10 to 14 days	{ 4th day of fever on forehead	{ 7th day of fever.
GERMAN MEASLES (Rötheln) . . .	7 to 14 days	{ 2d to 4th day of fever on face	{ 4th to 6th day of fever.
CHICKEN-POX . . .	10 to 14 days	{ 1st day of fever on shoulders	{ on 4th day of fever the vesicles form scabs.

FORMULÆ.

THE doses in the following prescriptions are intended for adults, and it is well for the student to remember that, if used for children, the rule suffices to divide the dose for an adult, in proportion to the number of years of the child's age divided by the age plus 12.

Thus, for a child of two years, it will be $\frac{2}{2+12} = \frac{2}{14} = \frac{1}{7}$, making the dose $\frac{1}{7}$ th of that of an adult.

If for a child of three years, $\frac{3}{3+12} = \frac{3}{15} = \frac{1}{5}$ ths, or $\frac{1}{5}$ th, etc.

Opium and its preparations act powerfully on children, and hence the dose must be reduced to a greater extent.

*Principal Preparations containing Opium, Mercury,
Arsenic, etc., with the proportions.*

Tinct. Opii contains gr. i. in min. xiv.
Tinct. Camph. Co. contains gr. i. in ℥ss.
Pil. Plumbi c. Opio contains gr. i. in gr. viij.
Pulv. Ipecac. Co. contains gr. i. in gr. x.
Pulv. Kino Co. contains gr. i. in gr. xx.
Enema Opii contains min. xv. Tinct., or gr. i. in ℥j.
Liniment Opii contains two fl. ounces of tincture in ℥iv.
Morph. Acet. Liquor contains gr. iv. in one fl. ounce.
Morph. Hydrochlor. Liq. contains gr. iv. in one fl. ounce.
Inject. Morph. Hypodermica contains gr. i. in min. xii.

MERCURY.

Hydrarg. c. Cretâ contains gr. i. in gr. iij.
Pil. Hydrarg. contains gr. i. in gr. iij.
Liq. Hydrarg. Perchlor. contains gr. $\frac{1}{8}$ in ℥i.

ARSENIC.

(Fowler's Solution.)

Liquor Arsenicalis contains gr. $\frac{1}{8}$ in min. v.
Liquor Sodæ Arseniat. contains gr. $\frac{1}{8}$ in min. v.
Liquor Arsenici Hydrochlor. contains gr. $\frac{1}{8}$ in min. v.

STRYCHNIA.

Liquor Strychniæ contains gr. $\frac{1}{8}$ in min. v.

(Donovan's Solution.)

A fluid drachm contains $\frac{1}{12}$ of a grain of arsenic, gr. $\frac{1}{2}$ mercury, and gr. $\frac{1}{2}$ of iodine. Dose min. x. to xxx.

1.—ALTERATIVES AND RESOLVENTS.

Mercury and Iodide of Potassium.

1. R Hydrarg. Perchlorid. gr. i., Potass. Iodid. ℥iij., Decoct. Sarsæ Co. ℥vj. M.—A tablespoonful thrice daily after food.

Mercury and Gentian.

2. R Hydrarg. Perchlor. gr. i., Ext. Gentian. ℥ss. Misce.—Divide into twelve pills; one thrice daily.
Useful in secondary syphilis.

Donovan's Triple Solution.

3. R Liquoris Hydriodatis Arsenici et Hydrarg. ℥iij., Tinct. Zingib. ℥iij., Aquæ ad ℥vj. Misce.—A tablespoonful thrice daily after food.
Useful in secondary syphilis and some skin eruptions.

Arsenic and Cinchona.

4. R Liquor. Arsenicalis ℥j., Tinct. Cardamom. Co. ℥iij., Decoct. Cinchon. ad ℥vj. Misce.—A tablespoonful thrice daily after food.
Useful in various skin affections.

Iodide of Potassium and Calumba.

5. R Potass. Iodid. ℥ij., Infus. Calumbæ ℥vj. Misce.—A dessert-spoonful thrice daily.
Useful in various diseases, syphilitic or otherwise.

Guaiacum Mixture.

6. R Tinct. Guaiaci Ammon. Co. ℥iij., Tinct. Aconiti m. xx., Mist. Camph. ad ℥vj. Misce.—Two tablespoonfuls thrice daily.
Recommended in Cynanche tonsillaris and some skin affections.

Chlorate of Potash.

7. R Potass. Chlorat. ℥ij., Syrupi Simplicis ℥iij., Aquæ Camph. ad ℥viij. M.—A tablespoonful every four hours.
Recommended in inflammatory affections of the mouth, etc.

Mercury, Rhubarb, and Soda.

8. R Hydrarg. c. Cretâ gr. ij., Pulv. Rhei gr. ij., Sodæ Bicarb. gr. iij. M.—Make a powder. One at bedtime.
Recommended in various infantile or children's diseases.

- 8a. R Cort. Condurango ℥ss., Aquæ ℥xii. Macerate for 12 hours, and then boil down to ℥vi. One to two tablespoonfuls twice daily.

Recommended for cancer of the stomach by Friedreich.

II.—ANTACIDS.

Bismuth, Hydrocyanic Acid, etc.

9. R Liq. Bismuth. (Scht.) ℥ss., Acid. Hydrocyan. dil. m. xl., Tinct. Card. Co. ℥ij., Spt. Chloroform. ℥ss., Aquæ ad ℥vj. Misce.—A tablespoonful thrice daily before food. Recommended in dyspepsia, for vomiting and pain.

Ammonia, Potash, and Chiretta.

10. R Ammon. Carb. ℥j., Potass. Bicarb. ℥ss., Inf. Chiretta ℥vj. Misce.—A tablespoonful thrice daily before food.

Useful for the acid eructations of dyspepsia and debility.

Magnesia and Soda.

11. R Magnes. Levis ℥ss., Sodæ Bicarb. gr. xx., Tinct. Aurantii ℥ss., Aquæ Menth. Pip. ℥i. Misce.—The draught; to be taken in heartburn, etc.

III.—ANTISPASMODICS.

Lobelia, Ether.

12. R Tinct. Lobel. ℥ij., Spt. Ether. Sulph. ℥ij., Tinct. Conii ℥ij., Mist. Amygdalæ ad ℥vj. M.—A tablespoonful every three hours.

In asthma and paroxysmal coughs.

Cardamoms and Ammonia.

13. R Tinct. Card. Co. ℥iv., Acid. Hydrocyan. dil. m. xl., Spt. Ammon. Arom. ℥ij., Tinct. Zingib. ℥ij., Spt. Chloroform. ℥ij., Aquæ Carui ad ℥vj. M.—A tablespoonful to be taken occasionally.

For flatulence or colic.

Valerian and Asafetida.

14. R Tinct. Valerian., Tinct. Asafet. aa ℥ij., Spt. Lavand. Co. ℥ss., Aquæ ad ℥vj. M.—A tablespoonful every three hours.

For hysteria, etc.

Gibb's Nitric Acid Mixture.

15. R Acid. Nit. dil. ℥xii., Tinct. Card. Co. ℥ij., Syrup. Simplicis ℥iiss., Aquæ ℥j. M.—A teaspoonful every two hours.

For hooping-cough.

Dr. Fuller's Belladonna Mixture.

- 15a. R Zinc. Sulphat. gr. viii., Ext. Belladon. gr. vii., Aq. ℥iv. M.—A teaspoonful four times daily, and increased by the proportion of one dose daily to a child above three years old.

IV.—ASTRINGENTS.

Sulphuric Acid and Opium.

16. R Acid. Sulph. dil. ℥iiss., Tinct. Opii ℥j., Spt. Chloroform. ℥ij., Aquæ Menth. Pip. ad ℥vj. M.—A tablespoonful after every liquid stool of adults.

For diarrhoea.

Catechu, Opium, and Chalk.

17. R Tinct. Catechu ℥ij., Tinct. Opii ℥j., Pulv. Aromat. ℥iss., Mist. Cretæ ad ℥vj. M.—A tablespoonful after every liquid stool of adults.

For excessive diarrhoea of typhoid fever.

Chalk Mixture, Cinnamon, and Opium.

18. R Tinct. Opii m. x., Pulv. Aromat. ℥j., Mist. Cretæ ℥vi., Aquæ Cinnamomi ad ℥iv. M.—A teaspoonful may be given every hour.

For diarrhoea of children.

- 18a. R Ol. Anisi, Ol. Cajuputi, Ol. Juniperi, aa ℥ss., Æther. ℥ss., Liq. Acid. Halleri ℥ss.,¹ Tinct. Cinnam. ℥ii. M.—Ten drops every quarter of an hour in a little water. An opiate may be given with the first and second dose. Used to promote reaction in cholera and diarrhoea.

Gallic Acid.

19. R Acid. Gallici gr. x., Aquæ ℥iss. M.—To be taken every four hours.

Useful in hæmoptysis and various hæmorrhages.

¹ Liquor Halleri consists of one part of concentrated sulphuric acid to three parts of rectified spirit.

Bismuth Mixture.

20. R Bismuth. Subnitrat. ℥j., Mucilag. Acaciæ ℥vj. M.—A tablespoonful every three hours.

Useful in diarrhœa of phthisis.

Cascarilla, Squills, and Dilute Sulphuric Acid.

21. R Tinct. Scillæ ℥iss., Acid. Sulph. dil. ℥iss., Tinct. Opii ℥ss., Inf. Cascarillæ ad ℥vj. M.—A tablespoonful every three hours.

Useful in chronic bronchitis, to check excessive expectoration.

*Starch and Laudanum Enema.*¹

22. R Tinct. Opii ℥ss., Ol. Terebinth. m. x., Mucilag. Amyli ℥ii. M.

It may be employed to check the diarrhœa of typhoid fever when excessive.

V.—CATHARTICS AND ANTHELMINTICS.

Calomel and Jalap.

23. R Calomel. gr. v., Pulv. Jalapæ gr. xv. M.

An active purgative.

Sulphate of Magnesia and Sulphuric Acid.

24. R Magnes. Sulph. ℥ij., Acid. Sulph. dil. ℥iss., Tinct. Card. Co. ℥iss., Aquæ Menth. Pip. ad ℥vj. M.—A wine-glassful every half-hour, until bowels act freely.

Aloes, Senna, and Jalap.

25. R Tinct. Sennæ, Tinct. Jalapæ, āā ℥ij., Decoct. Aloes Co. ad ℥vj. M.—An ounce night and morning.

Useful in bilious headache and constipation.

Rhubarb, Soda, and Aloes.

26. R Extract. Rhei gr. x., Sodæ Phosphat. ℥j., Decoct. Aloes Co. ℥ss., Aquæ Menth. Pip. ℥j. M.

A warm aperient, useful in the early stage of gout.

Elaterium and Colocynth.

27. R Elaterii gr. i., Ext. Colocynth. Co. ℥ss., Ext. Hyoscyam. gr. xii. Mix, and divide into twelve pills; one night and morning.

Useful in cardiac or other forms of dropsy.

Antimony, Sulphate of Magnesia, Citrate of Ammonia.

28. R Vin. Antimon. ℥j., Magnes. Sulp. ℥ss., Liquor. Ammon. Citrat. ℥ss., Aquæ ad ℥vj. M.—Two table-spoonfuls twice or thrice daily.
Useful as an aperient in the early stages of various disorders.
29. R Extracti Filicis Liquidi m. xxx., Pulv. Gum. Acaciæ ℥i., Aquæ Ment. Pip. ℥j.—Make an emulsion.
Considered a specific in tapeworm.
30. R Santonin. gr. ij., Pulv. Scammon. gr. iij. M.
Very effectual in expelling the round worm or thread-worm in children.

VI.—DIAPHORETICS.

Acetate of Ammonia with Ether.

31. R Liquor. Ammon. Acetat. ℥j., Spt. Ether. Nit. ℥ss., Tinct. Hyoscyam. ℥iij., Aquæ Camph. ad ℥vj. M.—A table-spoonful every three hours.
Useful in febricular and some inflammatory disorders.

Dover's Powder and Antimony.

32. R Pulv. Ipecacuanhæ Comp. gr. vj., Antimon. Tartarat. gr. ʒ. M.—One powder every six hours.

Guaiacum and Nitre.

33. R Pulv. Guaiac. ℥ss., Pulv. Potass. Nitrat. ℥j. M.—To be taken at bed time (some warm gruel to be taken after it).
Useful in chronic rheumatism.

Ipecac. and Citrate of Ammonia.

34. R Vini Ipecac. ℥ss., Syrupi ℥ss., Tinct. Camph. Co. ℥iij., Liquor. Ammon. Cit. ℥ss., Aquæ ad ℥ij. M.—A table-spoonful every two hours.
Useful in catarrhal and febrile affections of children.
- 34a. R Pilocarpin Muriat. gr. 0·3, Pepsinæ gr. x., Acidi Hydrochlor. gtt. ii., Aq. dest. ℥i. M.—A teaspoonful hourly has been recommended in diphtheria for children.

VII.—DIURETICS.

Squills, Broom, and Acetate of Ammonia.

35. R Tinct. Scillæ ℥ij., Liq. Ammon. Acet. ℥ij., Decoct. Scoparii ad ℥vj. M.—Two tablespoonfuls thrice daily.
Useful in dropsy dependent on heart, liver, etc.

Mercury, Squills, and Digitalis.

36. R Pil. Hydrarg. ʒss., Pulv. Scillæ gr. vj., Pulv. Digitalis gr. xii. M.—Divide into twelve pills. One twice daily.

Useful in pleurisy or pericarditis to remove effusion.

Acetate of Potass, Squills, and Digitalis.

37. R Potass. Acet. ʒss., Acet. Scillæ ʒss., Spt. Ether. Nit. m. xx., Tinct. Digitalis m. v., Decoct. Scoparii ʒiss. M.—The draught thrice daily.
- 37a. R Potass. Acetat. ʒiij., Potass. Citrat. ʒiij., Inf. Digitalis ʒvj. M.—A teaspoonful every three hours.

Bitartrate of Potass and Buchu.

38. R Potass. Bitart. ʒiij., Inf. Buchu ʒvj. M.—Two tablespoonfuls thrice daily.

Useful as a diuretic, and where there is very acid urine with an excessive secretion of uric acid.

Oil of Juniper, Nitric Ether, and Digitalis.

39. R Olei Juniperi ʒss., Spt. Ætheris Nit., Vini Ipecac., Tinct. Digitalis, aa ʒiij. M.—Twenty-five drops every three hours.

Diuretic, and in some cases also useful as an emmenagogue.

Nitrate of Potass and Barley Water.

40. R Potass. Nitrat. ʒij., Acid. Nit. dil. ʒj.—To be put into a pint of barley water and drunk daily.

Useful in the early stages of fever.

VIII.—EMETICS AND EXPECTORANTS.

Antimonial or Ipecacuan Emetic.

41. R Antimon. Tartarat. gr. i., Vin. Ipecac. ʒj., Aquæ ad ʒiss. M.

vel

42. Vin. Ipecac. ʒj.

Either of these draughts will relieve the stomach. They are sometimes recommended in the early stages of fevers, etc.

Tolu, Ammoniacum, and Opium.

43. R Syrupi Tolutani ʒss., Mist. Ammoniaci ʒij., Tinct. Camph. Co. ʒiij., Aquæ ad ʒvj. M.—A tablespoonful three times a day.

Useful in chronic bronchitis.

Ammonia, Squills, and Senega.

44. R Ammoniae Carbonatis ℥j., Tinct. Scillae ℥ijj., Tinct. Camph. Co. ℥ss., Infus. Senegae ad ℥vj. M.—A tablespoonful every four hours.

A stimulating expectorant in various chest affections.

Ipecac, Tolu, and Acacia.

45. R Vin. Ipecac. ℥ij., Syrup. Tolutani ℥iv., Mucilag. Acaciae ad ℥ij. M.—A teaspoonful every hour or every second hour.

Useful in acute bronchitis or measles with chest symptoms.

Lobelia, Spirit of Chloroform, and Conium.

46. R Tinct. Lobeliae ℥ij., Spt. Chloroform. ℥ijj., Tinct. Conii ℥ijj., Mist. Amygdalae ad ℥vj. M.—A tablespoonful three times a day.

Useful in asthma, etc.

IX.—GARGLES AND INHALATIONS.

Tannin Gargle.

47. R Tannin. ℥j., Aquae Camph. ℥vj. M.—The gargle; to be used frequently.
48. R Tinct. Myrrhæ ℥ijj., Aluminis ℥j., Infusi Rosæ Acidi ad ℥vj. M.—To be used frequently in mercurial salivation, or scarlatinal or aphthous ulceration of the throat.

Tannin and Glycerine.

49. R Tannin. ℥ss., Glycerini ℥iv. M.—The throat to be touched with this twice or thrice daily in scarlet fever, etc.

Borax and Glycerine.

50. R Sodæ Biborat. ℥j., Glycerini ℥ij. M.
Useful in ulceration of mouth and throat.

Nitrate of Potash.

51. R Potass. Nitrat. ℥j., Aquae ℥j.—Saturate white blotting paper in this solution, and dry it; cut the paper into pieces 3 inches long, $\frac{1}{4}$ inch broad. One piece may be lighted, and the smoke inhaled. One to six papers may be used in succession for each inhalation.
Recommended as an antispasmodic in asthma.

Hop Inhalation.

52. R. Ol. Humuli ℥ss., Magnes. Carb. Pond. ℥j. M.; Aquæ ad ℥iij. M.—A teaspoonful to be put into a pint of boiling water, afterwards used by Maw's inhaler.
Useful in phthisis, where cough is irritable, and in various chest affections.

Creasote and Carbolic Acid Inhalation.

53. R. Creasot. ℥iij., Magnes. Carb. Pond. ℥iss., Aquæ ad ℥iij. M.; or,
53a. R. Acid. Carbolic ℥i., Aquæ ℥vij. M.—A teaspoonful in a pint of water at 150° F. for each inhalation.
Useful in chronic congestion of the larynx.

Pine Inhalation.

54. R. Ol. Pini Sylvestris ℥ij., Magnes. Carb. Pond. ℥j., Aquæ ad ℥iij. M.—A teaspoonful in a pint of water at 150° F. for each inhalation.

X.—POWDERS, LOTIONS, LINIMENTS, ETC.

Soothing Dusting Powder.

55. R. Pulv. Amyli ℥ii., Zinci Oxidi ℥i., Pulv. Camphoræ ℥i. M.
May be used in acute eczema, in erysipelas, or shingles.

Prussic Acid and Perchloride of Mercury.

- 55a. R. Hydrarg. Perchlor. gr. ij., Acid. Hydrocyanici dil. ℥j., Mist. Amygdalæ ad ℥vj. M.
Useful in prurigo, and various skin affections attended with itching.

Prussic Acid and Potass.

56. R. Liquoris Potassæ ℥ij., Acid. Hydrocyanici dil. ℥j., Aquæ ad ℥vj. M.
Useful in pityriasis.
56a. R. Acidi Carbolic gr. viij., Glycerini ℥ss., Aquæ ad ℥j. M.
Applied to pustules in small-pox.

Soda and Glycerine.

57. R. Sodæ Bicar. ℥j., Glycerini ℥iss. M.
Useful in the itching of cutaneous diseases.

Lead and Glycerine Lotion.

- 57a. R. Liq. Plumbi Subacetatis ℥i., Glycerini ℥iii., Aquæ ad ℥vi. M.
Recommended in acute eczema, especially of the face.

Prussic Acid Lotion.

- 57b. R Acid. Hydrocyan. dil. ℥ii., Sodæ Bicar. ℥i., Glycerini ℥vi., Aquæ Rosæ ad ℥vi. M.
Used in acute eczema, and to relieve pruritus.

Oxide of Zinc Lotion.

- 57c. R Zinci Oxidi ℥iv., Glycerini ℥i., Aq. Calcis ℥ii., Aq. Ros. ℥vi. M.
Of service in acute eczema and acne rosacea.

Lotion of Potash Soap.

- 57d. R Saponis Mollis, Spt. Vin. Rect. ℥℥ ℥i., Aquæ ad ℥iv. M.
—Rub in well night and morning.
Useful in psoriasis and acne, and chronic eczema with much thickening.

Lotion of Potassa Fusa.

- 57e. R Potass. Fusæ gr. v.-xx., Aquæ ℥i. Solve.—Paint on at night, washing off when smarting becomes severe.
Valuable in the later stages of chronic eczema, with much thickening.

Sulphur Lotion.

- 57f. R Sulphuris ℥iii., Glycerini ℥iv., Spt. Vin. Rect. ad ℥iv. M.—Rub in at night. Valuable in acne vulgaris.

Carbolic Acid and Glycerine.

- 57g. R Acid. Carbol. pur. ℥ii., Glycerini ℥i. M.
Very useful in ringworm of the head; for a child of ten.
About half or one-third this strength for a child of three or four.

Corrosive Sublimate Lotion.

58. R Hydrarg. Perchloridi gr. iv., Spt. Vini. Rect. ℥iv., Aquæ ad ℥ii. M.—Rub in night and morning.
Used in Tinea of all kinds.

Corrosive Sublimate and Soap.

- 58a. R Hydrarg. Perchlor. gr. viii., Saponis Mollis ℥iiss., Spt. Vini. Rect. ℥iiss. Solve.—To be rubbed in night and morning.
Especially useful in tinea versicolor.

Corrosive Sublimate and Sal Ammoniac.

- 58b. R Hydrarg. Perchlor. gr. iii., Ammon. Hydrochloratis ℥ii., Tr. Benzoini ℥ii., Aquæ Rosæ ad ℥viii. M.
An excellent lotion for lentigo and other pigmentary spots.

Hyposulphite of Soda.

- 58c. \mathcal{R} Sodæ Hyposulphitis $\mathfrak{z}\text{ii}$., Glycerini $\mathfrak{z}\text{iv}$., Aquæ Rosæ ad $\mathfrak{z}\text{iv}$. M.
Useful in all varieties of tinea.

XI.—OINTMENTS.

Lead and Vaseline.

59. \mathcal{R} Empl. Plumbi, Vaselini, aa $\mathfrak{z}\text{ii}$. M.—Apply on strips of lint twice a day.
Most valuable in subacute eczema, especially of the limbs.
A modification of Hebra's *Ungt. diachyli*.

Oxide of Zinc and Camphor.

- 59a. \mathcal{R} Spt. Camph. $\mathfrak{z}\text{i}$., Glycerini $\mathfrak{z}\text{ii}$., Ungt. Zinci $\mathfrak{z}\text{i}$. M.
Useful in eczema, especially in children.
60. \mathcal{R} Ol. Cadini, Spt. Vini Rect., Sapon. Mollis, aa $\mathfrak{z}\text{j}$., Spt. Lavand. $\mathfrak{z}\text{iiiss}$. M.
Recommended by Dr. M'Call Anderson in eczema.

Oil of Cade and Starch.

- 60a. \mathcal{R} Ol. Cadini $\mathfrak{z}\text{ii}$., Glycerini Amyli ad $\mathfrak{z}\text{i}$. M.
A mild stimulant. Used in chronic eczema.

Sulphur and Potash.

- 60b. \mathcal{R} Sulphuris Sublim. $\mathfrak{z}\text{ii}$., Potas. Carb. $\mathfrak{z}\text{i}$., Adipis $\mathfrak{z}\text{i}$. M.
Used in scabies. To be rubbed in firmly over whole surface, except face and head, for 3 nights in succession.

Storax.

- 60c. \mathcal{R} Styracis præparat. $\mathfrak{z}\text{ii}$., Adipis $\mathfrak{z}\text{i}$. M.
Used in scabies for patients with a delicate skin.

Bismuth, Zinc, Prussic Acid.

61. \mathcal{R} Bismuthi Trisnitrat. $\mathfrak{z}\text{j}$., Ungt. Zinc. $\mathfrak{z}\text{j}$., Acid. Hydrocyanici dil. $\mathfrak{z}\text{j}$. M.
Useful in various skin affections.
62. \mathcal{R} Balsami Tolutani $\mathfrak{z}\text{ij}$., Olei Rosmarini m. xx., Tinct. Cantharid. $\mathfrak{z}\text{j}$. Olei Ricini $\mathfrak{z}\text{ss}$., Adipis Prep. $\mathfrak{z}\text{iiiss}$. M.
To be rubbed in night and morning to roots of hair in cases of baldness, after syphilis, fevers, etc.

Aconitia and Iodine.

63. \mathcal{R} Aconitiæ gr. ij., Ungt. Iodi $\mathfrak{z}\text{j}$. M.—To be painted over part in severe neuralgia (tic-douloureux).

Citrine Ointment.

64. \mathcal{R} Ungt. Hydrarg. Nit. $\mathfrak{z}\text{i}$, Adipis $\mathfrak{z}\text{i}$ M.
Used in vesicular, squamous, and some parasitic affections.

White Precipitate.

- 64a. \mathcal{R} Hydrarg. Ammoniat. gr. xii., Vaselini $\mathfrak{z}\text{i}$ M.—Rub in at night.
A mild parasiticide and a stimulant in chronic eczema.

Tar and Mercury.

- 64b. \mathcal{R} Ungt. Hydrarg. Nitratis $\mathfrak{z}\text{iss}$, Picis. Liquidæ, vel. Ol. Cadini $\mathfrak{z}\text{ii}$, Adipis Benzoat. ad $\mathfrak{z}\text{i}$.
Used in chronic eczema and for pruriginous eruptions.

Iodide of Sulphur Ointment.

65. \mathcal{R} Iod. Sulph. gr. x., Sulph. Sublim. gr. x., Acid. Hydrocyan. dil. m. x., Adipis $\mathfrak{z}\text{i}$ M.
Used in acne and other skin affections.

Chrysophanic Acid Ointment.

- 65a. \mathcal{R} Acidi Chrysophanici $\mathfrak{z}\text{i}$, Adipis $\mathfrak{z}\text{i}$. About the size of a bean to be rubbed into each patch of psoriasis daily.

Compound Citrine Ointment.

(Dr. Alder Smith's.)

- 65b. \mathcal{R} Acid. Carbol. Pur., Ungt. Hydrarg. Nitratis, Ungt. Sulphuris, aa $\mathfrak{z}\text{i}$ M.—Rub in every night.
Most valuable in ringworm of the head; for children under ten double or treble the quantity of sulphur ointment.

Oleate of Mercury.

- 65c. \mathcal{R} Hydrarg. Oleatis (5 %) $\mathfrak{z}\text{vii}$, Etheris Acet. $\mathfrak{z}\text{i}$ M.—Rub in night and morning.
Very serviceable in ringworm of the head.

Cod-liver Oil Emulsion.

- 65d. \mathcal{R} Ol. Morrhue $\mathfrak{z}\text{ii}$, rubbed with 30 grs. of Pulv. Acaciæ and $\mathfrak{z}\text{iss}$. of Aq. Dest. till an emulsion is formed, then gradually add with constant trituration $\mathfrak{z}\text{i}$. of Aq. Ment. Pip.

Depilatory.

- 65e. \mathcal{R} Sodii Sulphidi $\mathfrak{z}\text{iii}$, Calcis $\mathfrak{z}\text{x}$, Amyli, $\mathfrak{z}\text{x}$ M.—Mix with water to make a paste; apply to the skin for two minutes, then scrape off.

XII.—SALINES.

66. \mathcal{R} Spt. Ammon. Aromat. $\mathfrak{z}\text{ij}$., Liq. Ammon. Cit. $\mathfrak{z}\text{iv}$., Syrup. Limon. $\mathfrak{z}\text{j}$., Aquæ ad $\mathfrak{z}\text{viij}$. M.—A tablespoonful every three or four hours.

Useful in early stages of tonsillitis, diphtheria, or in febricula.

Chlorate of Potash (Fever drink).

67. \mathcal{R} Potass. Chlorat. $\mathfrak{z}\text{j}$., Aquæ Oj. M.
Recommended as a daily drink in scarlet or other fevers.

Colchicum and Magnesia.

68. \mathcal{R} Vini Colchici $\mathfrak{z}\text{ss}$., Magnes. Carb. $\mathfrak{z}\text{ij}$., Aquæ ad $\mathfrak{z}\text{vj}$. M.—A tablespoonful every three hours.

Useful in gout.

Or,

- 68a. \mathcal{R} Vini Colchici $\mathfrak{z}\text{ss}$., Magnes. gr. xv., Magnes. Sulphat. $\mathfrak{z}\text{j}$., Aquæ Cinnamom. ad $\mathfrak{z}\text{ij}$. M.

This draught is recommended by Sir Charles Scudamore during the paroxysm of gout.

XIII.—SEDATIVES.

Bromide of Potassium and Chloral.

69. \mathcal{R} Potass. Bromid. $\mathfrak{z}\text{ij}$., Chloral Hydrate $\mathfrak{z}\text{i}$., Aquæ $\mathfrak{z}\text{vj}$.—A tablespoonful every two hours.

Useful in delirium tremens, and also in fevers when there is great restlessness.

Opium and Antimony.

70. \mathcal{R} Tinct. Opii $\mathfrak{z}\text{ij}$., Antimonii Tartar. gr. iv., Aquæ Camph. ad $\mathfrak{z}\text{vj}$. M.—A tablespoonful every two hours until sleep is produced.

Useful in delirium tremens.

Morphia and Hydrocyanic Acid.

71. \mathcal{R} Morphiæ Hydrochlor. gr. i., Acid Hydrochlor. dil. m. v., Acid. Hydrocyanic. dil. $\mathfrak{z}\text{ss}$., Syrup. Scillæ $\mathfrak{z}\text{j}$. Aquæ $\mathfrak{z}\text{j}$. M.—One teaspoonful to be taken when cough is very severe, as in advanced cases of phthisis.

Bromide of Potass and Ergot.

- 71a. \mathcal{R} Potass. Bromid. $\mathfrak{z}\text{ij}$., Extract. Ergotæ Liquid. $\mathfrak{z}\text{j}$., Aquæ ad $\mathfrak{z}\text{vj}$. M.—A tablespoonful three times a day.
Useful in cerebral congestion, and also in infantile spinal paralysis in early stage.

XIV.—STIMULANTS.

Spirit of Chloroform and Brandy Mixture.

72. ℞ Spt. Chloroform. ℥j., Mist. Spt. Vini Gallici ad ℥vj. M.
—A tablespoonful every two hours in the low stages of fevers or other exhausting diseases.

Ammonia, Potass, and Rhubarb.

73. ℞ Spt. Ammon. Arom., Liquor. Potass., Tinct. Rhei, aa ℥j. M.—A teaspoonful twice a day in water, as an antacid stimulant and stomachic.

Soda and Calumba.

74. ℞ Sodæ Bicar. ℥j., Tinct. Calumb. ℥vj., Aquæ Anethi ad ℥vj. M.—A tablespoonful every three hours.
Useful to relieve heartburn and nausea.

XV.—TONICS.

Quinine Mixture.

75. ℞ Quiniæ Sulphatis ℥j., Acid. Sulph. dil. ℥iss., Syrup. Aurant., Tinct. Aurant., aa ℥iv., Aquæ ad ℥vj. M.—A dessert-spoonful three times a day.

Iron, Quinine, and Ammonia.

76. ℞ Ferri et Quiniæ Citratis ℥iss., Ammon. Carbonatis ℥ij., Tinct. Aurantii ℥ij., Aquæ ad ℥vi. M.—A tablespoonful three times a day.

Quinine and Gentian.

77. ℞ Ferri et Quiniæ Citratis, Ext. Gentian., aa ℥ss. M.—To be divided into twelve pills. One to be taken twice a day.

Iron and Hydrochloric Acid.

78. ℞ Tinct. Ferri Perchlor. ℥iss., Acid. Hydrochlor. dil. ℥j., Tinct. Hyoscyam. ℥iii., Inf. Calumb. ad ℥vj. M.—A tablespoonful three times a day.

Iron, Calumba, and Glycerine.

79. ℞ Tinct. Ferri Perchlor. ℥ij., Tinct. Calumbæ ℥ij., Glycerini ℥ij., Aquæ ad ℥vj. M.—A tablespoonful three times a day.

Useful in anæmia, and sometimes also in phthisia.

Strychnia and Nitric Acid.

80. \mathcal{R} Liquor. Strychniæ $\mathfrak{z}\mathfrak{j}$., Acid. Nitric. dil. $\mathfrak{z}\mathfrak{i}\mathfrak{s}\mathfrak{s}$., Acid Hydrochlor. dil. $\mathfrak{z}\mathfrak{i}\mathfrak{s}\mathfrak{s}$., Tinct. Zingiber. $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}\mathfrak{s}\mathfrak{s}$., Syrup. Croci $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$., Aquæ ad $\mathfrak{z}\mathfrak{v}\mathfrak{j}$. M.—A tablespoonful three times a day.

Useful in some spinal affections.

Syrup of Iodide of Iron and Cod-Liver Oil.

81. \mathcal{R} Syrupi Ferri Iodidi $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$., Mucilag. Acaciæ $\mathfrak{z}\mathfrak{j}$., Ol. Morrhuæ ad $\mathfrak{z}\mathfrak{v}\mathfrak{i}$. M.—A tablespoonful three times a day.

Hypophosphite of Lime and Glycerine.

82. \mathcal{R} Calcis Hypophosphitis $\mathfrak{z}\mathfrak{j}$., Glycerini ad $\mathfrak{z}\mathfrak{v}\mathfrak{j}$. M.—A tablespoonful three times a day.

Iron and Gentian.

83. \mathcal{R} Ferri Sulphatis, Ext. Gentian., $\mathfrak{a}\mathfrak{a}$ $\mathfrak{z}\mathfrak{s}\mathfrak{s}$. M.—Divide into twelve pills; one twice daily.

Citric Acid, Citrate of Iron, Bismuth, and Prussic Acid.

84. \mathcal{R} Ferri Citratis $\mathfrak{z}\mathfrak{i}\mathfrak{s}\mathfrak{s}$., Acid. Citrici $\mathfrak{z}\mathfrak{v}\mathfrak{j}$., Aquæ ad $\mathfrak{z}\mathfrak{v}\mathfrak{j}$. M. Acid. Hydrocyanici dil. m. $\mathfrak{l}\mathfrak{x}\mathfrak{x}\mathfrak{i}\mathfrak{j}$., Potass. Bicarb. $\mathfrak{z}\mathfrak{v}\mathfrak{j}$., Liq. Bismuth., Syrup. Aurantii, $\mathfrak{a}\mathfrak{a}$ $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$. M.—A dessert-spoonful of the contents of each, in a glass of water, thrice daily.

Recommended in dropsy from granular kidney.

85. \mathcal{R} Strychniæ gr. i., Ferri Pyrophosphatis, Quiniæ Sulph. $\mathfrak{a}\mathfrak{a}$ $\mathfrak{z}\mathfrak{i}$.; Acid. Phos. dilut., Syrup. Zingiber., $\mathfrak{a}\mathfrak{a}$ $\mathfrak{z}\mathfrak{i}\mathfrak{j}$. M.—A teaspoonful three times a day in a little water.

Recommended in some nervous affections when strychnia is required.

86. \mathcal{R} Olei Phosphorat. $\mathfrak{z}\mathfrak{s}\mathfrak{s}$., Mucilag. Acaciæ $\mathfrak{z}\mathfrak{j}$., Olei Bergamot. gtt. xl. M.—Twenty-five drops three times a day.

Useful in nervous affections requiring phosphorus.

Salicylic Acid Mixture.

87. \mathcal{R} Acid. Salicylici $\mathfrak{z}\mathfrak{i}\mathfrak{j}$., Potass. Acetat. $\mathfrak{z}\mathfrak{i}\mathfrak{s}\mathfrak{s}$., Aquæ $\mathfrak{z}\mathfrak{v}\mathfrak{j}$. M.—A tablespoonful every three hours.

Recommended in rheumatic fever.

88. \mathcal{R} Salicini gr. xx.—One every three hours.

Digitalis and Iron.

89. \mathcal{R} Tinct. Ferri Perchlor. $\mathfrak{z}\mathfrak{i}\mathfrak{l}$., Inf. Digital. ad $\mathfrak{z}\mathfrak{v}\mathfrak{i}$. M.—A dessert-spoonful thrice daily.

Ammonia, Citrate of Iron, and Calumba.

90. \mathcal{R} Ferri Ammon. Citrat. $\mathfrak{z}\text{j}$., Tinct. Calumbæ $\mathfrak{z}\text{iii}$., Aquæ Camph. ad $\mathfrak{z}\text{vj}$. M.—A tablespoonful thrice daily.
Useful tonic in kidney disease, etc.

Rhubarb and Pepsin.

91. \mathcal{R} Pulv. Rhei gr. iv., Pepsinæ gr. iij. M.
Useful in dyspepsia with flatulence. To be taken after meals.

Phosphate Mixture for Diabetes.

- 91a. \mathcal{R} Bone Ash of Femur, gr. 1040; Light Calc. Magnesia, gr. 406; Bicarbonate Potash, gr. 900; Phosphate of Soda, gr. 3520; Syrupy Phosphoric Acid, qs.; Water, qs. Powder the Bone Ash finely, and add 4 oz. of the Syrupy Phosphoric Acid, previously diluted with the same bulk of water. Mix thoroughly and allow to stand six or eight hours; mix the Magnesia with sufficiency of water to make a mass; and add sufficient of the phosphoric acid to form a solution. Dissolve the phosphate of soda and bicarbonate of potash in 16 oz. of water, and add the solution of magnesia, and then sufficient phosphoric acid to make a clear solution. Mix the Bone Ash and phosphoric acid, add water to form three pints, then filter the clear fluid. It must be made up by washing the filter to 64 oz.
 $\mathfrak{z}\text{l}$. in water after food.

Test for Diabetic Urine.

92. Fehling's Standard Solution is prepared according to the following prescription:—Sulphate of Copper, 90½ grains; Neutral Tartrate of Potash, 364 grains; Solution of Caustic Soda, sp. gr. 1·2, four fluid ounces; add water to make up exactly six fluid ounces. 200 grains of this solution are exactly decomposed by one grain of sugar.

The Ureameter.

93. To estimate the quantity of urea, the following apparatus is useful. The principle of the process depends on the evolution of nitrogen gas which ensues when urine comes in contact with hypobromite of soda. The first step is to make a solution of caustic soda, which is done by taking of Caustic Soda 1 oz., Water 2½ oz. Measure of this solution, as per mark on bottle, minims 420; add 40 minims of bromine. Shake well and

allow the mixture to cool thoroughly. We have now a solution of Hypobromite of Soda. Next take of the urine to be tested, as per pipette, 65 minims, which place in a small tube. Insert this into the bottle containing the Hypobromite of Soda solution. Cork, and read off the marking of the graduated tube.

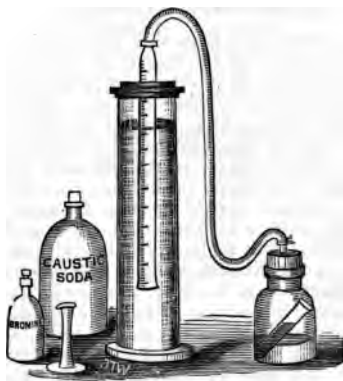


Fig. 15.

Next allow the urine and hypobromite of soda to mix. The result is the evolution of nitrogen gas. After the decomposition has ensued, the graduated index, after deducting the first from the last reading, will reveal the volume of nitrogen gas.

Mr. Dittmar, Professor of Chemistry at Anderson's College, has so constructed the index that each degree of it corresponds to one grain of urea per ounce in the urine. It is thus only necessary to measure the whole quantity of urine passed in the twenty-four hours, and then multiply that by what the index shows, after the evolution of nitrogen gas, to tell the quantity of urea excreted daily.

Thus, supposing the quantity of urine passed in twenty-four hours to be 50 ounces, and the number of grains per ounce of urine as read off to be 8, the total quantity of urea will be $50 \times 8 = 400$ grains.

The apparatus can be obtained from Mr. Motherwell, 295 Argyle Street, Glasgow.

94. The formula given by Mayer for detecting Quinine in the urine is, Water, 10; Corrosive Sublimate, 12·54; Iodide of Potass, 49. A cubic centimetre of this solution precipitates a centigramme of Quinine, and the precipitate does not disappear; it is insoluble.

METRIC SYSTEM.

The metric system of weights and measures has come largely into use of late years. On the Continent it has been long employed to the exclusion of all others, while in America it seems to be rapidly displacing the older methods. Its uniformity, the extent to which it has been adopted in other countries, its decimal character, and the avoidance of reductions (as from feet to inches, and so on), confer on it undeniable advantages, not only in scientific calculations but in trade transactions of almost all kinds. The student should therefore be acquainted with it, otherwise many matters in foreign scientific works will be to him unintelligible. The tables given below show the relation of the metric to the English weights and measures. In prescribing and dispensing, however, the metric system will be found to be much less workable than the present method; it is accordingly little likely to supersede it in this country. The facts that materials prescribed and dispensed by *weight* would universally, in the case of fluids at least, be consumed by *measure*, that the prescriber would constantly have to bear in mind the exact relation of weight to bulk—an obvious source of confusion in ordering complex mixtures—and that mistakes would be just as apt to occur from the misplacement of the decimal point as from the misreading of the scruple, drachm, and ounce signs, appear to be fatal to the pretensions of this system to any practical superiority.

MEASURES OF LENGTH.

Millimetre	0·001 of a Metre	0·03937 inch.
Centimetre	0·01 ,,	0·39370 ,,
Decimetre	0·1 ,,	3·93707 inches.
METRE	.	39·37079 ,,
Decametre	10 Metres	393·70790 ,, = 32 ft. 9·7 in.
Hectometre	100 ,,	3937·07900 ,, = 328 ft. 1·07 in.
Kilometre	1000 ,,	39370·79000 ,, = 1093·633 yds.
Myriometre	10000 ,,	393707·90000 ,, = 6·213 miles.

The English inch = 2·539 Centimetres, or 0·025 metre.
 ,, foot = 3·0479 Decimetres, or 0·304 metre.
 ,, yard = 0·9143 Metre.
 ,, mile = 1·6093 Kilometres.

WEIGHTS.

Milligramme	0.001 of a gramme	. 0.015 grain	
Centigramme	0.01	" 0.154	"
Decigramme	0.1	" 1.543	"
GRAMME	.	.	15.432 grains.
Decagramme	10 grammes	154.323	"
Hectogramme	100	1543.234	" = 0.22 lb. av.
Kilogramme	1000	15432.348	" = 2.204 lb. av.
Myriogramme	10000	154323.488	" = 22.046 lb. av.

The English grain = 6.479 centigrammes, or 0.064 gramme.

" " drachm = 3.84 (or nearly 4) grammes.

" " ounce (avdp.) = 28.349 grammes.

" " ounce (troy) = 31.103 grammes.

" " pound (avdp.) = 453.592 grammes.

MEASURES OF CAPACITY.

Millilitre or	1 cubic centimetre	0.061 cubic inch.	
Centilitre	10 " "	0.610 " "	
Decilitre	100 " "	6.102 " "	= 0.176 pt.
Litre = cubic decimetre	.	61.027 " "	= 1.76 "
Decalitre	.	17.607 pints	= 2.2 gallons.
Hectolitre	.	22.009 gallons.	
Kilolitre = cubic metre	.	220.09 "	
Myriolitre	.	2200.96 "	

The English cubic inch = 16.386 cubic centimetres.

" " " foot = 28.315 cubic decimetres.

" " gallon = 4.543 litres.

Prescribing will be facilitated by bearing in mind the following *approximate* equivalents:—

M. i. or gr. i. = 0.06 cubic centimetre or 0.06 gramme.

M. xv. or gr. xv. = 1 " " or 1 "

F. ʒi. or ʒi. = 4 " " or 4 "

F. ʒi. or ʒi. = 32 " " or 32 "

The gramme and the cubic centimetre, when referring to liquids, may be regarded as equal, except when the liquids are very heavy or very light.

An ordinary teaspoon holds about 5 cubic centimetres, an ordinary tablespoon about 20 c.c.

100 grms. or c.c. of water make about 20 teaspoonfuls, or 5 tablespoonfuls.

The following is an example of a prescription calculated according to both styles :—

R	Pepsinæ (B. P.) . .	ʒi	.	.	4	00 Grm.
	Acid. Hydrochlor. dil.	ʒiiss	.	.	6	00 c.c.
	Syr. Aurant. . . .	ʒi	.	.	32	00 c.c.
	Inf. Calumbæ ad . .	ʒviii (M.)	.	.	250	00 c.c. (M.)

A line is frequently used instead of the decimal points, as being less likely to give rise to errors.

THERMOMETRIC SCALES.

In the Centigrade (or Celsius) scale, used universally in Continental works on Medicine, the freezing point of water is taken as zero, and the distance from it to the boiling point of water is divided into 100 degrees; Fahrenheit's scale, on the other hand, begins at 32 degrees below the freezing point of water, from which to the boiling point of water is divided into 180 degrees. So that in the Centigrade scale the freezing and boiling points of water are 0° and 100° respectively, in Fahrenheit's scale, 32° and 212°. Degrees Fahrenheit therefore bear to degrees Centigrade the relation of 180 to 100, that is, 9 to 5; but in calculating, the extra 32 degrees of Fahrenheit's scale must be kept in mind, and must be first subtracted in converting F. into C., and added, after multiplying and dividing, in converting C. into F. The rules will therefore stand thus: To convert degrees F. into degrees C., first subtract 32°, and then multiply by 5 and divide by 9; to convert degrees C. into degrees F., multiply by 9, divide by 5, and add 32°. Example:

Reduce 98·4° F. to degrees C. ;

$$\begin{aligned} 98\cdot4 - 32 &= 66\cdot4 \\ 66\cdot4 \times 5 &= 332\cdot0 \\ 332\cdot0 \div 9 &= 36\cdot8^{\circ} \text{C.} \end{aligned}$$

Convert 39·5° C. into degrees F.

$$\begin{aligned} 39\cdot5 \times 9 &= 355\cdot5 \\ 355\cdot5 \div 5 &= 71\cdot1 \\ 71\cdot1 + 32 &= 103\cdot1^{\circ} \text{F.} \end{aligned}$$

GLOSSARY.

ACARUS SCABIEL.—From *ἀ* neg., *κείρω* to cut, and *scabere* to scratch.—The itch insect, whose presence gives rise to scabies, a contagious disease of the skin attended with great itching.

ACNE.—From *ἀκμή*, strength.—An eruption of hard, distinct, and inflamed tubercles appearing on the forehead, temples, etc.

ÆGOPHONY.—From *αἴξ* a goat, and *φωνή* voice.—A sound similar to the bleating of a goat. Heard through the stethoscope, when applied to the inferior angle of the scapula, in cases of pleurisy with effusion.

ALOPECIA AREATA.—From *ἀλώπηξ* a fox (a common affection of this animal), and *area* an open space.—Loss of hair, leaving little circular or oval bald patches.

ALTERATIVES.—From *αἰτέρο*, to vary.—Medicines which promote a salutary effect on the functions of the system without causing apparent evacuations.

AMENORRHŒA.—From *ἀ* neg., *μήν* a month, *ῥέω* to flow.—A suppression of the monthly discharge.

AMPHORIC.—From *ἀμφορεύς*, a Greek wine-vessel.—In auscultation, a sound similar to that produced by blowing into a decanter a little distance from the aperture.

AMYLOID.—From *ἀ* neg., *μύλη* a mill, *i.e.* not ground in a mill.—Resembling starch. If iodine be applied to an amyloid organ, the affected portions change to a brown colour, but, on the subsequent application of sulphuric acid, a bluish tint is produced.

ANÆSTHESIA.—From *ἀ* neg., *αἰσθάνομαι* to feel.—Loss of sensation.

ANASARCA.—From *ἀνά* through, *σάρξ* flesh.—A collection of serum in the integuments of the body, characterised by pitting on the application of pressure.

ANEURISM.—From *ἀνευρίνω*, to make wide.—A swelling produced by the dilatation of an artery.

ANGINA PECTORIS.—From *ἀγχω* to strangle, and *pectus* the breast.—A dangerous affection, characterised by a sense of suffocation, severe pain at the chest, and great anxiety.

ANTHELMINTICS.—From *ἀντί* against, *ἐλμυς* a worm.—Medicines which expel worms from the intestines.

ANTIPYRETICS.—From *ἀντί* against, *πυρετός* fever.—Remedies used for allaying fever.

APHASIA.—From *ἀ* neg., *φῶσις* speech.—A partial or complete loss of the power of speech, due to cerebral causes.

APHONIA.—From *ἀ* neg., *φωνή* voice.—Loss of voice.

APHTHA.—From *ἀπὸ*, to fix upon.—Thrush. Small round white vesicles affecting lips, mouth, and intestinal canal.

APOPLEXY.—From *ἀπὸ* of the cause, *πλήσσω* to strike.—Loss of sensation and voluntary motion, whilst the respiration and heart's action are slightly, or not at all affected.

ARCUS SENILIS.—From *arcus* anything arched or curved, and *senilis* aged.—An opaque ring round the margin of the cornea observed in old people.

ASCARIDES.—From *ἀ* intensivum, *σκαλπω* to bound, jump.—Intestinal worms.

ASCITES.—From *ἀσκός*, a leather sack or wine-skin.—A collection of serous fluid within the peritoneum.

ASTHMA.—From *ἀσθμάω*, to gasp for breath.—A sensation of suffocation, or constriction of the chest with cough and expectoration.

ATROPHY.—From *ἀ* neg., *τρέφω* to nourish.—Progressive wasting of the whole or a portion of the body, caused by decrease in size or number of its histological elements.

BOTHRIOCEPHALUS LATUS.—From *βοθρίον* a small pit, *κεφαλή* a head.—The broad tapeworm.

BRONCHIECTASIS.—From *βρόγχος* the windpipe, *ἐκτασις* a stretching out.—Dilatation of the bronchi.

BRONCHOCELE.—From *βρόγχος* the windpipe, *κήλη* swelling.—An inaccurate term for an enlargement of the thyroid gland.

BRONCHOPHONY.—From *βρόγχος* the windpipe, *φωνή* voice.—A distinct, but not loud, sound of the voice heard when the stethoscope is applied to the chest in cases of pneumonia, phthisis, and other consolidations.

BRUIT DE POT FÊLÉ.—Sound of a cracked vessel, heard sometimes on percussing over a cavity in the lung, when it is near the surface, and communicates with an open bronchus.

CACHEXIA.—From *κακός* evil, *ἔξις* habit.—A depraved condition of the body, which is usually the result, and not the cause, of disease.

CARDIALGIA.—From *καρδία* the heart, *ἄλγος* pain.—A burning pain referred to the stomach. Heartburn.

CASEATION.—From *caseus*, cheese. A pathological process observed in tuberculosis, when the inflammatory product becomes yellow, friable, and dry.

CATAMENIA.—From *kard* answering to, *μήν* a month.—The menstrual discharge of females.

CATARRH.—From *καταρρέω*, to flow down.—Inflammation of, and discharge of fluid from, a mucous membrane. Generally used to denote a common cold affecting the nose (Coryza), the frontal sinuses (Gravedo), and trachea and bronchial tubes (Bronchitis).

CATHARTICS.—From *καθαίρω*, to purge.—Medicines which increase the number of intestinal evacuations.

CAVERNOUS RESPIRATION.—From *caverna*, a cave, grotto.—A hollow sound heard during auscultation, in dilated bronchi, and diseases causing excavation in the lung tissue. Tracheal respiration.

CHLOASMA.—From *χλωάω*, to be of a pale, light green.—An eruption of light yellowish-brown patches on the chest and abdomen. Dark circles round the eyes.

CHLOROSIS.—From *χλωρός*, green—generally pale, pallid.—Green sickness. Peculiar to young girls suffering from disordered or arrested menstrual flow. There is frequently a green tint of the complexion.

CHOREA.—From *χορεύω*, a dancing.—A disease attended with erratic movements, grimaces, twitchings, and gesticulations of an involuntary character.

CIRRHOSIS.—From *κιρρός*, yellow.—An increase of connective tissue in the liver or lungs, which may be so excessive as to absorb or destroy the natural structure by pressure. In cirrhosis of the liver the pale colour is due to the large amount of yellow pigment in the secreting cells; the liver is also smaller and puckered, producing the hob-nailed condition.

CLONIC.—From *κλόνος*, any violent motion, tumult.—A term applied to convulsive movements in which contraction and relaxations alternate.

CONDYLOMATA, pl. of Condyloma.—From *κόνδυλος*, a knuckle.—Indolent wart-like protuberances about the genital organs and anus.

CORYMBOSE.—From *κόρυμβος*, a cluster of fruit or flowers terminating in a flat plane.

CORYZA.—From *κάρα* the head, and *ζέω* to boil.—A mucous, ropy discharge from the nostrils, caused by inflammation of the Schneiderian membrane.

CREPITATION.—From *crepito*, to crackle.—A sound heard in the first stage of pneumonia, prior to consolidation, and in the third stage (resolution). It is also manifest in acute capillary bronchitis and pulmonary oedema.

CUTIS ANSERINA.—*Cutis* skin, *anser* a goose.—A condition of the skin observed in the early stage of fever and in various nervous affections, and resembling the skin of a plucked goose.

CYANOSIS.—From *κύανος*, blue.—Lividity or duskiness of the face. Observed in affections interfering with the entrance of air into the lungs.

CYNANCHE PAROTIDEA.—From *κύων* a dog, *ἀγχω* to choke; *παρά* belonging to, *ὠς* the ear.—Mumps. Inflammation of the parotid gland.

CYSTICERCUS.—From *κύστις* the bladder, *κέρκος* a tail.—A genus of the Entozoa of the family of the hydatids. The tailed-bladder worm.

DESQUAMATION.—From *desquamo*, to scale off.—Separation of the epidermis in the form of scales.

DIABETES.—From *διδ* through, *βαίνω* pass.—Great increase of the secretion of urine.

DIAPHORETICS.—From *διδ* through, *φορέω* to carry.—Remedies which promote perspiration.

DIATHESIS.—From *διατίθημι*, to arrange, dispose.—A morbid tendency. A peculiar predisposition to certain diseases.

DIPHTHERIA.—From *διφθέρα*, a skin or membrane.—An epidemic disease of the throat, consisting of the formation of false membranes, which appear on uvula and palate, tonsils and pharynx, extending into pharynx and larynx, and are at first white, but afterwards become darker. These diphtheritic patches separate by sloughing.

DIPSOMANIA.—From *δίψα* thirst, *μανία* rage.—An insatiable desire for alcohol, observed in habitual drunkards.

DIURETICS.—From *διδ* through, *ούρώ* to pass urine.—Medicines which promote an increased flow of urine.

DYSENTERY.—From *δύς* with difficulty, *έντερον* bowel.—Inflammation and ulceration of the mucous membrane of large intestine and rectum, attended with griping and mucous and bloody stools.

DYSPEPSIA.—From *δύς* with difficulty, *πέπτω* or *πέσσω* to soften, digest.—A disordered condition of the functions of the stomach. Indigestion.

DYSPŒA.—From *δύς* with difficulty, *πνέω* to breathe.—Difficult, laboured, obstructed breathing.

ECCHYMOSIS.—From *ἐκχυμώω*, to pour out.—A blue or black discoloration from an extravasation of blood into the areolar tissue.

ECHINOCCOI.—From *ἐχίνος* hedgehog, *κόκκος* a berry.—Immature tapeworms or hooklets, found in hydatid cysts, most commonly in the liver.

ECTHYMA.—From *ἐκθύω*, to break out.—Skin disease characterised by large pustules and inflammation of a severe type.

ECZEMA.—From *ἐκφέω*, to boil up.—An inflammatory disease of the skin, with formation of vesicles, which, from irritation or other causes, may become pustules.

EMBOLISM.—From *ἐμβόλη*, a wedge or plug.—The obstruction

of a blood-vessel by a fibrinous concretion, which has been detached from the heart or one of the vessels.

EMPHYSEMA.—From *ἐμφυσάω*, to inflate.—1. Infiltration of air into the interlobular areolar tissue. 2. Dilatation of air-cells, which assume the size of hemp seeds.

EMPYEMA.—From *ἐν* within, *πύον* pus.—A collection of pus within the cavity of the pleura.

ENCEPHALITIS.—From *ἐγκέφαλος* brain, terminal *-itis*.—Inflammation of the brain and its membranes.

ENDEMIC.—From *ἐν* amongst, *δῆμος* people.—Referring to diseases peculiar to certain localities.

ENDOCARDITIS.—From *ἐνδον* within, *καρδία* the heart, terminal *-itis*.—Inflammation of the serous membrane which lines the interior of the heart.

EPIDEMIC.—From *ἐπὶ* upon, *δῆμος* people.—Applicable to diseases which attack large numbers simultaneously.

EPILEPSY.—From *ἐπιλαμβάνω*, to seize, attack.—Sudden and complete unconsciousness, with a series of convulsive movements.

ERUCTATION.—From *eructo*, to belch.—Expulsion of wind from the stomach by the mouth.

ERYTHEMA.—From *ἐρυθθαίνω*, to redden.—Arises from some derangement of the system, and consists of a mere redness of the skin, not extending to the cellular tissue.

ETIOLOGY.—From *αἰτία* cause, *λόγος* discourse.—An account of the causes of disease.

EXACERBATION.—From *exacerbo*, to make angry.—An increase of the strength and fury of the symptoms of a disease.

EXANTHEMATA.—From *ἐξανθένω*, to break out, to bloom.—Diseases of the skin, consisting of an eruption of red patches, which disappear transiently under pressure.

EXOPHTHALMIC GOITRE.—From *ἐξ* out, *ὀφθαλμος* the eye.—Protrusion of the eyeball, accompanied by goitre.

EXPECTORANTS.—From *expectoro*, to discharge from the chest.—Medicines which facilitate the removal of secretions collected in the chest.

FEBRIFUGE.—From *febris* fever, *fugo* to drive away.—A medicine which possesses the power of diminishing the severity of fever.

FISTULA, a pipe, tube, reed.—A passage with narrow opening, the result, generally, of ulcer or abscess.

FOMITES, pl. of *fomes*, touchwood, tinder.—Porous substances which absorb and retain contagious effluvia, as woollen clothing, cotton materials, etc.

FREMITUS, murmuring, growling.—Vocal fremitus is a vibration communicated to the hand when placed on the chest whilst the patient is speaking. It is absent or diminished in pleuritic effusion, and increased in pulmonary consolidation.

GASTRALGIA.—From *γαστήρ* stomach, *ἄλγος* pain.—A sensation of pain in the stomach of a burning character.

GASTRODYNIA.—From *γαστήρ* stomach, *δύνη* pain.—Cramp or spasmodic pain in the stomach.

GASTROTOMY.—From *γαστήρ* stomach, *τέμνω* to cut.—The operation of opening the stomach.

GLYCOSURIA.—From *γλυκός* sweet, *οὐρὸν* urine.—Sugar in the urine.

GRAVEDO.—From *gravis*, heavy.—Inflammation of membrane lining the frontal sinuses.

GUMMATA.—From *gumma*, an elastic tumour containing a substance like gum.—Small, firm, yellow-whitish tumour surrounded by a capsule formed of degenerated tissues. Characteristic of syphilis.

HÆMATEMESIS.—From *αἷμα* blood, *έμέω* to vomit.—Vomiting of blood from the stomach.

HÆMATINURIA.—From *hæmatin*, the red colouring matter of the blood, *οὐρὸν* urine.—Dark-coloured urine, containing no blood, but merely the colouring-matter of the blood.

HÆMOPTYSIS.—From *αἷμα* blood, *πτύω* to spit.—Bleeding from the lungs.

HÆMORRHAGE.—From *αἷμα* blood, *ρήγνυμι* to break forth.—Bursting forth or discharge of blood.

HEMIPLEGIA.—From *ἡμιος* half, *πλήσσω* to strike.—Paralysis affecting one side of the body.

HEPATISATION.—From *ἥπαρ*, the liver.—A term applied to the lungs when impervious to air, and the structure assuming a liver-like appearance.

HERPES.—From *έρπω* to creep.—A skin disease consisting of small vesicles upon inflamed bases.

HYALINE.—From *δαλός* glass.—A transparent, colourless substance.

HYDATIDS.—From *ὕδωρ* water.—Cysts filled with a limpid fluid, floating in which are the immature tapeworms.

HYDRAGOGUES.—From *ὕδωρ* water, *άγω* to expel.—Medicines which cause watery evacuations.

HYDROCEPHALUS.—From *ὕδωρ* water, *κεφαλή* the head.—A collection of water within the head.

HYDRONEPHROSIS.—From *ὕδωρ* water, *νεφρός* the kidney.—Dropsy of the kidney.

HYDROPHOBIA.—From *ὕδωρ* water, *φοβέω* to fear.—Madness caused by the bite of a rabid animal.

HYPERTROPHY.—From *ὑπέρ* above, increase, *τρέφω* to nourish.—Excessive growth or enlargement of a part, caused by increase in size or number (or both) of tissue elements.

HYPOCHONDRIASIS.—From *ὑπό* under, *χόνδρος* cartilage.—Morbid sensibility, mental alienation. Probably derives its

name from an uneasy feeling experienced in the hypochondriac regions.

HYSTERIA.—From *ὑστέρα*, the womb.—A nervous disorder confined almost entirely to susceptible females, consisting of a morbid imagination, peculiar deceptions, and amorous excitement.

ICHTHYOSIS.—From *ἰχθύς*, skin of a fish.—A hard, dry, scaly, not contagious, disease of the skin.

IDIOPATHIC.—From *ἴδιος*, peculiar, separate.—A spontaneous or primary disease. Not dependent upon another.

IMPETIGO.—From *impeto*, to attack.—A pustular disease of the skin, forming thick yellowish incrustations.

INSOLATIO.—From *in, sol*, the sun.—An affection due to the direct action of the sun's rays—Sunstroke.

INTERSTITIAL.—From *inter* between, *sto* to stand.—By some called fibroid. Pertaining to an increase and hardening of the connective tissue.

INTUSSUSCEPTION.—From *intus* within, *suscipio* to receive.—Introduction of one part of the bowel into another, just as the finger of a glove is pulled within itself.

LARYNGISMUS STRIDULUS.—From *λαρυγγίζω* to bawl, *stridulus* a hissing sound.—Spasm of the muscles of the glottis, usually nocturnal, preventing the entrance of air, and hoarse, croupy cough. False croup.

LARYNGITIS.—From *λαρυγξ* the windpipe, terminal *-itis*.—Inflammation of the larynx.

LEUCOCYTHÆMIA.—From *λευκός* white, *κύτος* a cell, *αἷμα* blood.—A superabundant development of the colourless corpuscles of the blood. White-cell-blood.

LICHEN.—From *λεῖχη* moss.—A skin disease in which the papules are distinct or arranged in clusters. Very irritating and obstinate.

LOCOMOTOR ATAXY.—From *ἀ neg.*, *τάσσω* to order.—An absence of co-ordination in the movements of the muscles.

LUPUS.—From *lupus*, the wolf.—A spreading, corroding, tuberculous disease.

LYSIS.—From *λύω*, to dissolve.—The gradual diminution and termination of a fever without critical symptoms.

MACULA.—From the Latin *macula*.—A permanent discoloration of some portion of the skin, and sometimes associated with alteration of its texture. It is not dependent on any disease of the constitution.

MARASMUS.—From *μαραίνω*, to waste or pine away.—Progressive wasting.

METALLIC TINKLING.—A sound like that caused by striking glass or metal with a pin. A pathognomonic symptom of pneumothorax with effusion.

MENINGITIS.—From *meningium*, terminal *-itis*.—Acute inflammation of the pia mater and arachnoid.

MYALGIA.—From *μῦς* a muscle, *ἄλγος* pain.—Muscular soreness, stiffness, or pain. Cramp.

MYELITIS.—From *μυελός* marrow, terminal *-itis*.—Inflammation of the spinal cord.

NEPHRALGIA.—From *νεφρός* the kidney, *ἄλγος* pain.—Pain and neuralgia in the kidney.

NEPHRITIS.—From *νεφρός*, the kidney, terminal *-itis*.—Inflammation of the kidney.

NUMMULAR.—From *nummula* a little coin.—Applied to sputa lying flat at the bottom of a vessel, and having the appearance of small coins.

ŒDEMA.—From *οἰδέω*, to swell.—Dropsical swelling, from accumulation of serous fluid in the subcutaneous areolar tissue.

OIDIUM ALBICANS.—From *ὄν* an egg, *εἶδος* resemblance.—A vegetable parasite, seen on the mucous membrane of cheek and throat, as white spots and patches.

OPISTHOTONOS.—From *ὀπισθε* behind, *τείνω* to stretch.—Spasm of the neck, back, and loins, causing arch-like appearance of the back.

OXYURIA.—From *ὀξύς* sharp, *οὐρά* a tail.—Small thread-worm.

PARACENTESIS.—From *παρά* by the side, *κεντέω* to stab.—The operation of removing fluid from the chest by tapping.

PARALYSIS.—From *παράλυω*, to relax or disable.—Diminution or total loss of voluntary motion, or sensibility, or of both.

PARAPLEGIA.—From *παραπλήσσω*, to strike badly.—Palsy affecting the lower half of the body.

PARESIS.—From *παρήμι*, to unloose, relax.—Partial paralysis, consisting of a slight inability of movement.

PATHOGNOMONIC.—From *πάθος* suffering, sickness, *γινώσκω* to perceive.—Applied to the distinguishing symptom or symptoms of a disease.

PECTORILOQUY.—From *pectus* the breast, *loquor* to speak.—The sound of the voice heard during auscultation, which appears to be transmitted directly from the chest into the ear.

PERICARDITIS.—From *περί* about, *καρδία* the heart, terminal *-itis*.—Inflammation of the sero-fibrous membrane covering the heart.

PERITONITIS.—From *περιτείνω*, to stretch all round, terminal *-itis*.—Inflammation of the serous membrane lining the walls of the abdomen.

PERITYPHLITIS.—From *περί* around, *τυφλός*, blind, terminal *-itis*.—Inflammation of the areolar tissue which connects the psoas and iliacus muscles with the cæcum.

PETECHIA.—From *petechio*, a flea-bite. — A small red or

purplish spot, in shape and colour similar to a flea-bite, and due to subcutaneous hæmorrhage.

PHOTOPHOBIA.—From *φῶς* light, *φόβος* fear.—Aversion to and intolerance of light. Found in certain stages of meningitis, measles, typhus, and many diseases of the eye.

PHTHISIS.—From *φθίω*, to pine or waste away.—Progressive emaciation. Consumption of the lungs. Decline.

PLEURISY.—From *pleuritis*, *πλευρά* the side, terminal *-itis*.—Inflammation of the serous membrane lining the walls of the chest, and reflected upon each lung.

PLEUODYNIA.—From *πλευρά* the side, *ὄδυνη* pain.—Pain, seated in the walls of the chest, and ordinarily in the intercostals.

PLEXIMETER.—From *πλήσσω* to stride, *μέτρον* a measure.—An ivory plate used in mediate percussion of the chest.

PNEUMONIA.—From *πνευμονία*, a disease of the lungs.—Acute inflammation of the substance of the lung.

PNEUMOTHORAX.—From *πνεῦμα* air, *θώραξ* the chest.—A collection of air in the pleural cavity. If serum, also Hydro-pneumothorax; if effusion purulent, Pyopneumothorax.

PODAGRA.—From *πούς* the foot, *ἄγρᾱ* seizure.—Gout situated in the joints of the foot.

PROPHYLACTIC.—From *πρὸ* before, *φυλάσσω* to avoid.—The preventive treatment of disease.

PRURIGO.—From *prurio*, to itch.—A papular eruption, attended with severe itching.

PSORIASIS.—From *ψώρα*, itch, mange.—A disease of the skin characterised by patches of rough scales.

PTOSIS.—From *πτῶω*, to fall.—A falling of, or inability to raise the upper eyelid.

PUERPERAL.—From *puer* a child, *pario* to bring forth.—Relating to women recently delivered.

PURPURA.—From *πορφύρα*, the purple fish.—Purple spots and patches on the skin from extravasation, due to a morbid condition of blood and capillary vessels.

PYÆMIA.—From *πύον* pus, *αἷμα* blood.—Contamination of the blood from absorption of pus.

PYELITIS.—From *πύελος*, a tub, trough, terminal *-itis*.—Inflammation of the pelvis, infundibula, and calyces of the kidney.

PYROSIS.—From *πυρῶω*, to burn.—A disease consisting in a hot sensation in the stomach, and copious eructation of thin, watery, acid, or insipid fluid.

PYTHOGENIC.—From *πύθω* to rot, *γεννᾶω* to generate.—A term applied to typhoid, gastric, or enteric fever.

RABIES.—From *rabio*, to be furious.—A disease of dogs and other animals, which, if implanted by means of the saliva into the human system, produces Hydrophobia.

RALES.—From *raler*, to rattle in the throat.—Liquid sounds produced by the air passing through mucus or other fluids.

RESOLVENTS.—From *resolvere*, to relax, undo.—Substances possessing the power of promoting the resolution of tumours.

RHONCHUS.—From *ῥῆγχος*, a rattling sound in the throat.—*Sonorous* rhonchus is a dry deep-toned sound produced by obstruction to the tide of air in a large bronchial tube. In the smaller tubes the pitch is higher, and whistling, hissing sounds are heard, called *sibilant* rhonchi.

ROSEOLA.—Diminutive of *rosa*, a rose.—An efflorescence of transient patches of redness. Non-contagious.

RUBEOLA.—From *rubeo*, to blush. A disease combining certain symptoms of scarlatina with symptoms resembling those of measles.

RUPIA.—From *ῥύπος*, dirt, uncleanness.—A non-contagious eruptive disease, characterised by flat vesicles, succeeded by dark and rough crusts.

SARCINA VENTRICULI.—From *σάρκινος*, fleshy.—A microscopic cryptogamous plant, found in the contents of the stomach in pyrosis.

SCABIES.—From *scabo*, to scratch.—A contagious cutaneous disease, attended with severe itching.

SCIATICA.—From *ἰσχίον*, the hip.—Pain in the sciatic nerve.

SCLEROSIS.—From *σκληρός*, hard, tough.—An increase of connective tissue, which may destroy the natural structure by pressure.

SCROFULA.—From *scrofa*, a sow.—A morbid state of the system revealed by chronic swelling and suppuration of the absorbent glands, etc.

SEPTICÆMIA.—From *σήπω* to rot, *αἷμα* blood.—Putrid infection. A morbid state of the blood, due to the presence of bacteria, *i.e.* rod-like microscopic bodies.

SEQUELÆ.—From *sequor*, to follow.—Morbid affections left as the result of a disease.

SHINGLES.—From *cingulum*, a girdle.—The popular name for Herpes zoster, a vesicular disease which compasses half the circumference of the body.

STENOSIS.—From *στενός*, to make narrow.—Contraction of a vessel.

STERCORACEOUS.—From *stercus*, excrement.—A term applied to fecal vomiting.

STOMATITIS.—From *στόμα*, a mouth, terminal *-itis*.—Inflammation of the mouth, which may be parasitic, vesicular, ulcerative, or gangrenous.

SUBSULTUS TENDINUM.—From *subsulto*, to leap.—An involuntary twitching of the tendons, generally observable at the wrist. Evidence of great cerebral irritability.

SUDAMINA.—From *sudo*, to sweat.—Small transparent vesicles which appear in numbers upon the skin in diseases accompanied by sweating.

SYCOOSIS.—From *σῦκον*, a fig.—An eruption of inflamed tubercles clustering about the beard and scalp. Ringworm of the beard.

SYNCOPE.—From *συνκῆπτω*, to knock to pieces.—Partial or complete suspension of respiration and the action of the heart. Sudden prostration.

SYPHILIS.—From *σύν* with, *φιλέω* to love.—An infectious disease communicable by sexual coition.

TABES.—From *tabeo* to decay.—Emaciation, usually the result of tubercular degeneration.

TÆNIA.—From *ταῖα*, a band or ribbon.—The tapeworm.

TENESMUS.—From *τείνω*, to stretch, to strain to the utmost.—A painful desire to go to stool, with great straining.

THROMBOSIS.—From *θρόμβος*, a clot of blood.—Partial or complete obstruction of a vessel by a morbid product formed at the occluded spot.

TINEA CIRCINATA.—From *tinea* a gnawing worm, *circinatus* to be compassed about.—A contagious and parasitic disease attacking the general surface of the body, and characterised by rings spreading from a centre.

TINEA DECALVANS.—From *decalvo*, to make bald.—Falling off of the hair, leaving little circular or oval bald patches.

TINEA FAVOSA.—From *favus*, a honeycomb.—This disease affects the scalp, and the hairs are found to pierce a small, dry, cup-shaped, yellow scab.

TINEA TONSURANS.—From *tondeo*, to shave.—A disease of the scalp, in which are present patches of baldness, with scaly eruption.

TINEA TRICOPHYTINA.—From *τριξ* the hair, *φύτον* a vegetable.—A vegetable parasite affecting the scalp, the hairy part of the face, or any portion of the skin.

TINEA VERSICOLOR.—From *verso* to turn, *color* colour.—A vegetable parasitic disease marked by the presence of yellow-coloured patches on the chest and abdomen, and covered with small scales.

TONIC SPASM.—From *τείνω*, to stretch.—Referring to rigid contraction of the muscles without relaxation.

TOPHI, pl. of *tophus* or *tofus*, volcanic rock.—Chalk stones. Concretions of urate of soda with animal matter, found in the joints of gouty subjects.

TRICHINA SPIRALIS.—From *τριξ* a hair, *σπειρα* anything wound round.—A species of entozoa infesting the voluntary muscles.

TUBERCULOSIS.—Diminutive of *tuber*, elevation or excrescence.

—A morbid condition distinguished by small nodular lesions found in the organs and tissues.

TYMPANITES.—From *τύμπανον*, a drum. — Accumulation of wind in the bowels, spherical projection of the abdomen, and increased resonance on percussion.

TYPHLITIS.—From *τυφλός*, blind; terminal *-itis*.—Inflammation of the cæcum.

TYPHOID.—From *τύφος* to make dull or restless, *είδος*: resemblance.—A slightly contagious fever generated by decomposed animal matter, and distinguished by increased vascularity of Peyer's glands, followed by ulceration.

TYPHUS.—From *τύφος*, to make dull or restless (or *τύφος*: smoke).—A continued contagious fever marked by great prostration and mental disturbance.

UREMIA.—From *urea*, *αίμα* blood.—A condition of urea in the blood, which acts as a poison to the nervous centres.

URTICARIA.—From *urtica*, a nettle. — An affection distinguished by an eruption of wheals, resembling the elevations produced on the skin by the stings of nettles.

VARIOLLA.—Diminutive of *variola*, chicken-pox.—A mild eruptive disorder characterised by transparent vesicles of the size of a pea, and appearing in successive crops.

VARIOLA.—From *varius*, spotted. — A contagious disease marked by fever and an eruption passing through papular, vesicular, and pustular stages. Upon shrinking of the pustules scabs are formed. Small-pox.

VIBICES, pl. of *vibex*, the mark of a stripe.—Large purple spots appearing under the skin, and found in purpura, scurvy, small-pox, typhus, and liver and splenic diseases.

ZYMOTIC.—From *ζύμη*, leaven, yeast.—Zymotic diseases are those which depend on some morbid poison acting on the organism in the manner of a ferment. They are contagious, febrile in character, and rarely attack the same person more than once. Zymotic diseases are—small-pox, chicken-pox, typhus fever, typhoid, scarlet fever, the plague, measles, hooping-cough, mumps.

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